This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

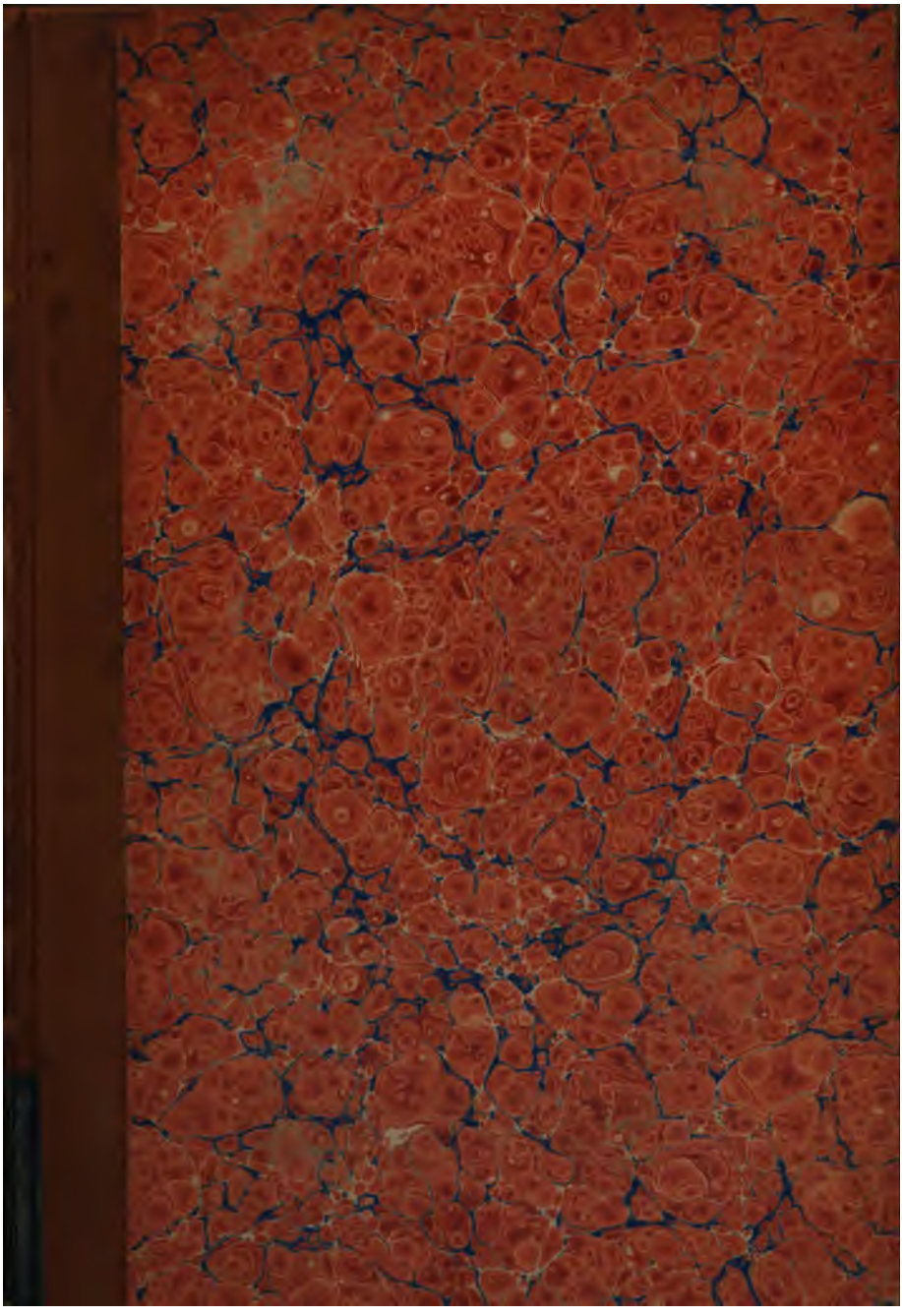
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



THE
POULTRY YARD.
J.R.Jobbins

THE

POULTRY YARD;

COMPRISING THE

MANAGEMENT OF ALL KINDS OF FOWLS.

BY W. C. L. MARTIN.

WITH ILLUSTRATIONS.

LONDON:
GEORGE ROUTLEDGE & CO., FARRINGDON STREET.
1852.

189. c. 99.

CONTENTS.

CHAPTER I.

PAGE

THE GENERAL TREATMENT AND MANAGEMENT OF FOWLS . 1

CHAPTER II.

ON THE STRUCTURE AND HABITS OF GALLINACEOUS BIRDS—THE CHARACTER OF THE PHASIANIDÆ—AND THE ORIGIN OF THE COMMON FOWL 28

Order, *Rasores* 28

Family, *Phasianidæ*; genus *Gallus* 35

Great Malay or Kulm Fowl 37

Javanese Jungle Fowl 40

Sonnerat's Jungle Fowl 42

Stanley's Jungle Fowl 42

CHAPTER III.

ON THE PRINCIPAL BREEDS OF FOWLS IN OUR ISLAND—ON THEIR VALUE IN AN ECONOMIC POINT OF VIEW 46

The Game Fowl 46

The Kulm or Malay Fowl 49

The Duke of Leeds' Fowl 50

The Black Poland Fowl 51

The White Poland Fowl 51

The Spangled Poland Fowl 52

The Spangled Hamburg 52

The Spangled or Dutch Everlasting Layer 52

The Spanish Fowl 53

The Dorking Fowl 54

The Persian or Rumpless Fowl 56

The Frizzled or Friezland Fowl 56

The Silky Fowl 57

The Black Fowl 57

The Bantam Fowl 57

The Russian Fowl 59

The Barn-door Fowl 60

Economic value of Fowls 60

CHAPTER IV.

PAGE
THE TURKEY 66
The Honduras Turkey 68
The Common Turkey—Wild 69
Ditto, Domestic 72

CHAPTER V.

THE PEA-FOWL 83
The Javanese or Javan Pea-fowl 86
The Guinea-fowl or Pintado 88
The Curassows 92
The Galeated Curassow 95
The Crested Curassow 97
The Guan 99

CHAPTER VI.

THE COLUMBINE ORDER 100
The Common Turtle Dove 104
The Ring Dove 104
The Stock Dove 105
The Rock Dove 105
Domestic Pigeons 106
The Carrier, or Horseman 109
The Dragon, or Dragoon 110
The Barb 111
The Pouter 111
The Fantail 112
The Jacobine 112
The Turbit 113
The Nun 113
The Trumpeter 113
The Tumbler 114
The Almond Tumbler 114

CHAPTER VII.

DUCKS AND GEESE 116
Order *Natatores*; Family *Anatidæ* 116
The Common Duck—Wild 119
Ditto Domestic 121
The Musk Duck 124
Sub-family, *Anserinæ*—Geese 126
Canada, or Cravat Goose 126
The Chinese Swan-goose 130

PAGE
The Gray-lag Goose 132
The Bean Goose 132
The White-fronted Goose 132
The Pink-footed Goose 132
The Domestic Goose 132

CHAPTER VIII.

Diseases 139
Apoplexy 139
Pip, or Thrush 140
Gapes 140
Inflammation of the Lungs 142
Peritoneal Inflammation, or Peritonitis 142
Inflammation of the Mucous Membrane of the Intestinal Canal 143
Simple Diarrhœa 143
Constipation of the Bowels 143
Asthma 143
Inflammation and Intumescence of the Rump Gland . . 144
Moulting 144

LIST OF CUTS.

	PAGE
Ovarium of Fowl	11
Gizzard of Turkey	32
Javanese Jungle Fowl	40
Sonnerat's Jungle Fowl	42
The Game Cock	47
The Kulm, or Malay Fowl	49
The Spangled Poland Fowl	51
The Spanish Fowl	54
Sir J. Sebright's Silver Bantams	58
The Wild Turkey	69
The Peacock	84
The Guinea Fowl	89
The Galeated Curassow	96
The Crested Curassow	97
The Rock Dove	103
The Carrier Pigeon	110
The Summer Duck	117
The Wild Duck, or Mallard	120
The Musk Duck	124
The Canada Goose	129
The Chinese Goose	131
The Common Goose	135

POULTRY.

CHAPTER I

THE GENERAL TREATMENT AND MANAGEMENT OF FOWLS.

WHATEVER breed of fowls be selected for keeping, provision must be made for their comfort and safety. Fowls attached to farm-houses lead in many respects a happy life. They have good air and plenty of room, with no lack of food; they wander about the farm-yard and the straw-yard, visit the adjacent fields or paddocks, travel over the common or down the lane, troop around the barn, and enjoy total freedom. To the advantage of pure air they have that of pure water, and the opportunity of varying their diet by picking up insects and their larvæ: and a store of pebbles, gravel, old mortar, and other calcareous matter which they require, is always at their command. So far it is well; but how are they housed at night? Often in a proper and well-built poultry-house, with perches judiciously arranged, and with baskets or boxes lined with straw for the hens; but often in places utterly unfitted for them. For example, at a farm-house which we had occasion to call at in Kent, we found that the fowls, which were numerous, lodged mostly under the thatch of a large open shed, above the waggons and carts, which received their droppings in abundance; others took shelter in adjacent outhouses, and some in the stable. This want of order cannot be too much condemned—the hens having no proper laying-places, select such as chance may offer them, not unfrequently in obscure places of concealment, so that the eggs are lost. A safe and convenient fowl-house should be found in every farm-yard where poultry are kept, and the common

fowls should have their exclusive dormitory. Farm-yard poultry are in general healthy and vigorous, nimble on their feet, and able with their wings. How different these to birds kept, as we have seen, to the number of twelve or more, in a space inclosed by lattice-work, not more than ten or twelve feet square, including their house or den, in which they huddle together, and in which a row of hen's nests is placed! How different these from the wretched-looking fowls to be seen in the streets of London, as in Monmouth Street and others adjacent, with dirty dishevelled plumage, pale combs, and dull eyes, and which dive for nightly shelter into the gloom of some damp unwholesome cellar, whence they emerge in the morning to pick up their subsistence in the kennel! The streets of London are no more fitted for fowls than was the blacksmith's shop for ducks, which, as the story goes, the man kept there to make the *smithy look rural.*

We do not, however, mean to say that fowls are to be kept only by farmers or cottagers; on the contrary, let the conveniences be present, and the number in accordance with the extent of range allotted to them, and then fowls may be kept with pleasure and profit. Those who intend to rear fowls should have a distinct yard, perfectly sheltered, on a large scale, with a warm aspect, well fenced, secure from thieves and vermin, sufficiently inclined to be always dry, and supplied with gravel, old mortar (not quick-lime) or chalk, and with sand or ashes for the fowls to roll in. Running water should if possible be provided, that is, a stream directed through the yard; but if this cannot be managed, a trough of water, fresh every morning, may be substituted; want of water, of which all poultry are fond, produces constipation of the bowels and inflammatory diseases. A contiguous field or paddock is moreover desirable. The fowl-house should be dry, well-roofed, and fronting the east or south, and, if practicable, at the back of a stove or stables—warmth being greatly conducive to health and laying, though extreme heat has the contrary effect. It should be furnished with two small lattice windows at opposite ends, which can be opened or shut at pleasure for the purposes of ventilation, which is frequently necessary. The perches should be so arranged that one row of roosting fowls should not be directly above the other; and a ladder of perches should be constructed, so as to enable the fowls to ascend and descend without using their wings, for heavy fowls fly up to their roost with difficulty,

and often injure themselves by flying down, as they come heavily to the ground.

Where fowls have the run of a wide, dry, sandy common, of an orchard, or of fields, and are able to procure clean water, a good poultry-house is all that is essential, though even then a yard or inclosure is desirable, for the better management and safety of the young broods.

Though a poultry-yard should be open and airy, it should be sheltered from cold winds, and its soil should be dry. A simple shed, moreover, should be erected in some suitable spot, in order to afford a screen to the fowls from the hot rays of the mid-day sun in summer, and from heavy showers. Should there be no access to a paddock or orchard, it is desirable that a portion of the yard should be laid down with turf, and consequently the larger such a poultry-yard is the better. Cleanliness, both in the poultry-house and in the yard, is indispensable. "Cleanliness," observes Mr. Beatson (*Commissioner to the Board of Agriculture*), "with as free a circulation as possible, and a proper space for the poultry to run in, are essential to the rearing of poultry with advantage and success, as in narrow and confined situations they are never found to answer well." The same writer also remarks, that nothing more is requisite for the keeping of poultry with profit and advantage, beyond having a shed or light building formed in some warm, sunny, and, at the same time, sheltered situation, fitted up with proper divisions, boxes, lockers, or other contrivances, for the dwelling of the different sorts of birds, and places for their laying in. To this we may add, that partitions or cribs for the reception of sickly or diseased fowls are very useful. A sickly fowl ought to be immediately separated from the rest of the flock, not only because the disease may be contagious, but for the sake of the fowl itself. Pining fowls are very often objects of dislike, not only to the cock, who is apt to ill-treat the weakly or the suffering of his seraglio, but even to the hens, who evince their hostility and rancour in no very measured manner, sometimes to the positive destruction of their unfortunate companion.

The size of the fowl-house must of course be in accordance with the number of fowls kept. M. Parmentier (*Dictionnaire d'Agriculture*) has shown by what arrangement a house twenty feet long, and twelve feet wide, may be made to accommodate 150 hens at roost. The plan is simply this. The first roosting perch (rounded a little at the upper angles only, for galli-

naceous fowls cannot keep a firm hold on perfectly cylindrical supporters), should be placed lengthways, and rest on tressels in each end wall, six feet from the front wall, at a convenient height, which must depend on the elevation of the house from the floor, which latter must be formed of some well-consolidated material that can be easily swept. Another perch should be fixed, *en échelon* (ladder ways), above this, but ten inches nearer to the back wall, and so on until there are four of these perches, like the steps of an inclined ladder, but with a sufficient distance between the wall and the upper perch to allow the poultry-maid to stand conveniently, when she has occasion to examine the nests, which it is her duty to do once at least every day, and in the forenoon. The highest of these she can reach by standing on a stool or step-ladder. By this contrivance the hens, when desirous of reaching the nests, have no occasion to fly, but merely to pass from one perch to another. If the size and form of the house permit, a similar range of perches may be made on the opposite side, care being taken to leave an open space in the middle of the room, and a sufficiently wide passage for the attendant to pass along the walls. It is not at all required to have as many nests as hens, because they have not all occasion to occupy them at the same time, and besides, they are so far from having a repugnance to lay in a common receptacle, that the sight of an egg stimulates them to lay. It is however true, that the most secluded and darkest nests are those which the hens prefer.

The nests, if built into the wall, are in tiers from the bottom to the top, the lowest being about three feet from the ground and a foot square. But if the laying chambers consist of wooden boxes, they are usually furnished with a ledge, which is very convenient for the hens when leaving the nest or entering it.

It is, however, generally admitted by all practically conversant with the rearing and management of poultry, that baskets of wicker-work are the best receptacles for the nests; they are cooler in summer, they can moreover be taken down and well washed and refilled with fresh clean straw. The lowest tier of baskets should be used for such fowls as are selected for rearing broods, and they should be so arranged and placed that the hens can easily enter or leave them without disturbing the eggs; moreover, they should be screened from observation or possibility of disturbance. Wheaten

straw, or rye straw, should be used for the beds or nests; hay is too hot, and tends too much to the production of swarms of parasitic insects of the louse tribe, which render the nest uncomfortable, and not unfrequently cause the hens to forsake them. Dried heath, and dried fern leaves, especially the former, are well adapted for the same purpose as the straw. Where fancy fowls of different breeds are kept, each flock must have its own fowl-house, and its own *run* or yard, otherwise a mixture of the breeds will infallibly take place; in fact, a sort of aviary is requisite, in the construction of which much taste may be displayed, not of course without a certain degree of expense, for this is an affair of luxury and ornament, not of mere profit. Of such a character is the royal poultry house or aviary for fowls at the Home Farm at Windsor. The building is of a semi-gothic style, and "consists of a central pavilion, flanked by roosting places, and breeding and laying nests. The pavilion is used as a spot whence the fowls can be conveniently inspected, and is surmounted by an elegant pigeon-house, remarkable for its lining of looking-glasses, in which pigeons delight to gaze, and before which they are constantly pruning and dressing themselves.

"The ground slopes in front towards the park, and is divided by slight wire fences into yards, as walks or places for the daily exercise of the fowl; these wards are laid out in gravel walks and grass plots, the former leading to the entrance of the houses. The apartments are large and airy, the fittings and general economy of the house have been carefully regulated with reference to the natural habits of the birds, an equal temperature is constantly maintained, and in form and structure the nests are made to resemble the close and bramble-covered recesses which would form the dwelling of poultry in a state of nature."

Such aviaries are appropriate ornaments on the grounds or in the parks of the opulent, and their establishment tends to keep up the finer breeds of domestic poultry in their utmost purity. So far they are useful and laudable; but they are kept up to gratify the taste, profit being neither expected nor desired.

In order to keep fowls with advantage, attention must be paid to the relative number of the cocks and hens composing the flock. On this point there is some difference of opinion. M. Parmentier considers that one cock is sufficient for

twenty hens, which in France, perhaps, may be the case, but not in our climate. Indeed it is found by experience, that, if the cock be placed over a numerous seraglio, the chickens produced are feeble, and the breed soon degenerates. The old breeders of game fowls allowed only three hens to one cock in his walk; and where the renovation of a breed is required, this proportion should not be exceeded.

As a general rule, from eight to twelve hens may be assigned to one cock, but not more—nor, indeed, so many, if the fowls are kept in a confined yard, where the depressing influence of captivity will be more or less experienced. Mr. Bradley (*Farmer's Director*) lays it down as a law, that only seven or eight hens be allowed one cock, under any circumstances; and other writers of experience recommend that this proportion be not exceeded. In cold or humid districts, perhaps, this may be for the best; but in warm dry localities, where the fowls have a free walk, and are healthy, as many as ten or twelve hens may be safely allowed.

When there are two or more cocks, a little management will be required to prevent a succession of conflicts, which ought to be prevented. Where the cocks are of the same age, it is almost impossible to prevent their fighting; but one cock may be brought up under another, each in its turn gaining the ascendancy over the others. Suppose, for example, a stock of fowls intended to be numerically increased; their number is twelve, with a single cock at their head. Out of the young chickens hatched, a certain number will be selected for keeping. Among these should be the most promising and beautiful of the young cocks. When this new comer is a twelvemonth old, the previous bird will be two years old. The number may again, in like manner, be added to, till the stock is sufficiently numerous. When the old cock is past his fourth year, it will be advisable, generally speaking, to get rid of him (though for the table he will be useless), as he then becomes lazy, violent in temper, and excessively jealous. Should it be deemed necessary to introduce a new cock, a young bird should be selected, and introduced to the hens in the moulting season, when his older rival will take but little notice of him, and ultimately become reconciled to him by the time that the laying season commences, and, during this interim, he will ingratiate himself with a certain number of the hens, which will acknowledge his governance.

Where numerous fowls are kept, we have mostly observed that each cock has his own female train, which follows him, and is always at his call. The fowls are divided into parties or groups, and have each their favourite places of resort; hence they interfere less with each other than might be expected; but should a strange cock make a sudden appearance on the premises, he will have many a hard fight before he can establish himself, either in his character of a conqueror or a defeated champion.

Much has been said by some, relative to the selection of the cock; but all their directions come to one point. Whatever be the breed to which he belongs, he should exhibit the distinctive characters of that breed in full perfection; he should be bold, lively, clean made, with close glossy plumage, and a bright eye; his comb and wattles should be of a rich vermilion; his crow should be clear, loud, and long-drawn; his breast should be broad and fleshy, his thighs muscular and firm, and his *tarsi* stout and armed with sharp spurs; his claws should be strong, slightly hooked, and sharp; and he should carry himself with a proud, yet graceful air. We need not say that he should be in perfect health. We are now supposing that the chosen cock is to be introduced to no rival, but to a seraglio reserved for him exclusively. The question then is, what should be his age? We say from a year and a half to two years—not less than a year, nor more than two years; for, although some birds retain all their fire and energy until five or even six, still they are beyond their prime after the third, or at most the fourth year, and will then probably disappoint the breeder.

Some cocks, especially when they are getting past their prime, are unsocial, vicious, and tyrannical. Instead of scraping up delicacies for the hens, and collecting them around him by a clucking note of invitation, the surly bird attacks them without provocation, tears their combs, and otherwise greatly injures them. Let such a despot be deposed from his proud pre-eminence as soon as possible. On the other hand, a young cock in his prime will sometimes take a hatred to some particular hen, and though he treats the rest as becomes a gallant cavalier, towards her he exhibits a marked antipathy. In general, this dislike is manifested to aged hens, in which, perhaps, internal disease has begun to manifest itself. Hens, in fact, are frequently to be seen which have assumed, not only the plumage, the hackles, and

tail of the cock, but imitate him also, though imperfectly, in his crow. In these cases the power of reproducing eggs is invariably lost, owing, as has been fully demonstrated by Mr. Yarrell, to a diseased or schirrous condition of the ovaries.—See *Proceeds. Zool. Soc.*, 1831, p. 22; *Philosophical Transact.*, 1827; and also a paper by Dr. Butter, in the *Memoirs of the Wernerian Society*, vol. iii.

In the introduction of a fresh mate to a number of hens, care should be taken that he does not become their victim of oppression; for hens also have their objects of dislike, and, unnatural as it may seem, sometimes fall upon a cock, presented to them in lieu of a predecessor, and dreadfully punish him. We believe that this strange conduct on the part of the hens occurs chiefly among flocks kept in confinement, and there are instances of hens, under such circumstances, taking a sudden dislike towards a cock with whom they have previously lived on the most amicable terms.

As in case of other birds, nature designs that every hen shall sit upon her own eggs, and hatch her own progeny; but the domestic hen is in an artificial state, and deviations from the laws of nature are therefore to be expected. A wild hen will lay no more eggs than she can conveniently cover, and her periods for laying and for incubation will be fixed and regular. On the contrary, domestic hens lay many more eggs than they can cover. Some lay every day, or every other day, for nine months out of the twelve, and never or rarely evince a desire to incubate; while others evince this desire, some at one period, others at another period. Among a flock of hens these diversities will show themselves, and advantage may be taken of them with benefit to their owner. A hen prompted by instinct to the task of incubation, asks only for eggs suited to her size, be they those of her own production or not (those even of a duck will be accepted), a nest, and undisturbed solitude. At this juncture, she utters an instinctive cluck, ruffles her feathers, wanders about, searches obscure corners and recesses, and is evidently ill at ease. She is feverishly hot, impatient, and anxiously restless. In high-fed hens this instinctive desire comes on sooner than in such as are not supplied with food in abundance, and it may be induced by stimulating diet, such as bread steeped in ale, a little raw liver or fresh meat chopped small, potatoes mashed warm, with milk and oatmeal. By high feeding, some hens, especially of the Dorking breed, which, as sitters, take the

pre-eminence over all other breeds, may be induced to sit in October, especially if they have moulted early. Advantage may be taken of this circumstance, and chickens may be obtained fit for the table by Christmas—not, however, without great care and trouble, as in the case of house-lamb, ready at the same season. The incubation must take place, and the chickens be reared and fed in a warm room, kept at an equal temperature. Generally speaking, spring chickens are more desirable; which should be hatched in January, so as to be ready for the market in the latter part of March, and through the months of April, May, and June. They require great care, but they return an ample profit.

The most usual time in which hens manifest a desire to incubate, extends from March to May or June, and at this season chickens may be reared without any extraordinary precautions. The hens selected should be of large size, well feathered, with short legs, and of mature age. The number of eggs allotted to a single hen may vary from twelve to fourteen, but should never exceed the latter number. It is by no means uncommon with experienced breeders, to place two hens on the same day, on their respective eggs, and then on the twenty-first day, when the broods come forth, to give the maternal charge of both to one of the hens, removing the other to a fresh set of eggs, which, if she be a steady sitter, she will hatch, as in the first instance. This, however, must be deemed a cruelty; it is well known that some hens would sit until they became so feeble and emaciated as to be restored with difficulty. What, then, shall we say to those who make a hen sit several times in succession, and that by constraint? as did a French lady, Maddle. de Portebois (see Art. Poule, in *Encyclop. Méthodique*). Markham is wrong when he states his opinion that long sitting does not injure the hens. To sit twice is a tax on the system; and no one but a person dead to feeling of consideration for the lower animals, would permit a hen, however constant to her task, to sit three or four times.

A proper supply of food and water should be placed so as to be readily accessible to each hen during her period of incubation, but she should not be fed upon her nest; let her be left to instinctive guidance. At due intervals she will leave her eggs for a minute, feed and refresh herself, and return with renewed strength to her eggs, over which she broods with feelings of satisfaction. Officious interference cannot be too much condemned.

In selecting eggs for hatching, care should be taken that they are not above a fortnight or three weeks old: they should be of large size, and heavy, and with one end smaller than the other; large rounded eggs are apt to contain a double yolk, and to produce monstrosities. If the eggs are all of the same age, to a day, the better. It has been asserted that the sex of the bird to come from each egg is indicated by the shape of the latter—those with the small end blunt, producing females; and those of an oblong shape, males A writer on poultry says, "Sketchley tells us that he has always found the round egg to contain the female chick, and that of oblong shape, the male. This, however, though it may have been newly discovered by Sketchley, was known to Columella and Stephanus." This is contradicted, and with sufficient reason, as we believe; and not only is it impossible to foretell the sex, but even to ascertain with certainty if the egg be fecundated. The same writer to whom we have alluded says, "If you examine the egg between your eye and a candle, you will be able to discern the position caused by the little air-bag at the blunt end of the shell. If this be in the centre, the egg will produce a cock; if at one side, a hen." How far this test is to be relied upon, we do not know; but according to this theory, the position of the air-cell will be different in rounded and acute eggs, the former containing females, the latter males. We can only say we have seen no facts which lead us to receive it with implicit confidence. But this we know, that if the air-cell at the obtuse end of the egg, the purpose of which is to ogygenate the blood of the chick, be perforated, even in the least conceivable degree, the vitality of the embryo is at once destroyed.

The structure of the eggs of birds, clearly exemplified in that of the common fowl, and the progressive development of the chick, are subjects which, though familiar to the scientific, are not generally understood. We have known some who have regarded the air-cell as the germ of the chick, and others the yoke or *vitellum;* while most consider the shell as an impervious covering. We may here give a little information on these points, which will not, we hope, be unacceptable. The external superficies of an egg consists of a shell of particles of lime, deposited around the white or albumen, in the last dilated portion of the egg duct. Now this external shell, though important as a safeguard, is not one of the essential constituents of an egg; therefore we shall consider it the

last. We must first begin with the formation of the egg. The egg is first formed in the egg-producer or ovary, and this ovary is single and on the left side of the spine—or to speak more correctly, although there are two egg-producers, that on the right generally remains undeveloped, or, as it were, in a state of permanent atrophy. The fertile ovary or egg-producer (*ovarium*), attached by folds of peritoneal membrane to

OVARIUM OF FOWL.

the spine, presents an appearance something like a cluster of grapes—only that the eggs, which are connected together by narrow pedicles, are of different sizes, according to their different degrees of development. The *ovarium*, therefore, is racemose, consisting of a number of pedunculated *ovisacs*, each producing its own egg or *ovulum*. Each *ovisac* consists of two membranes; the external is vascular, and surrounded by a pale zone (apparent in those of larger development), which

is termed the *stigma*. The lining membrane of the *ovisac* is very thin and pellucid, but studded on its inner surface with granules, probably of a glandular nature. Within these ovisacs are the eggs, or rather the *ovula*, essentially formed. When considerably developed, each *ovulum* consists of an orange yellow and somewhat oleaginous matter, or yolk (vitellum), inclosed in a membrane of exquisite delicacy. Upon the surface of this yolk is to be seen an opaque and slightly elevated spot, called *citricula*, wherein is lodged the reproductive, but as yet unvivified germ, appearing in the form of a most minute transparent globule, the germinal vesicle, called, after its discoverer, the *vesicle of Purkinje*. The ovulum thus constituted ripens, as it may be said, and attains its full development; fecundation takes place; the ovisac, previously thinned by absorption, becomes ruptured at the zone or *stigma;* and the *ovulum*, covered only by its own delicate membrane (*membrana vitelli*), is received by the expanded or funnel-shaped opening of a tube, called the *oviduct*. During this transfer, the *vesicle of Purkinje* disappears (probably it is ruptured), and its inclosed germ takes its station in the *cicatricula*, which has lost something of its previous appearance, and is now called *blastoderma* (βλαστὸς, a germ, and δερμα, skin —that is, the skin enveloping the germ, or the germinal membrane). From this *blastoderm*, a narrow canal leads to a chamber in the centre of the yolk, which is filled with a whitish granular substance.

Received into the oviduct, the yolk becomes gradually enveloped in glairy fluid or *albumen*, added layer upon layer, and secreted by the mucous membrane, which lines the upper part of that canal. Besides the ordinary *albumen* or *white*, transparent longitudinal strings of inspissated albumen are deposited, the future use of which is to suspend the *yolk* in the *white*, keeping it in its place, turned about as the egg may be. These cords are termed *chalaza* (χαλάζω, to suspend), and first appear in the form of membranes, which gradually gather into two delicate spiral cords.

The yolk, now invested with layers of albumen, advances still farther in the oviduct, and now gains a denser but thinner covering, which consists of two layers of a fine parchment-like tissue. First one layer is thrown over the albumen, and then the other; but the last is at the larger end of the egg, separated from the former, leaving a space called the air-cell or *vesicula aeris*, filled with oxygen, or at least with air con-

taining an unusual proportion of oxygen. This double membrane is called the shell-skin, or *membrana putaminis*.

With the exception of the shell, the egg is now complete. It passes onward; and in the latter portion of the oviduct the *membrana putaminis* becomes coated with a deposit of calcareous particles forming the shell, to which, in many birds, colouring matter, the secretion of certain minute glandular pores, is added, producing various patterns, or styles of marking. Being now finished, the egg passes from the oviduct into the dilated *cloaca*, its last receptacle, and is ready to be deposited in the nest.

The shell is composed of particles of lime, extremely minute, and of a polygonal form, so as to produce by their accumulation a delicate crust, which, smooth and close as it may appear, is nevertheless, from the form of its composing particles, pierced by exquisitely fine pores. It is therefore consequently permeable by air (as are the membranes lining it); and this the more so, as the shell becomes thinner during the progress of incubation, in consequence of absorption. Hence, in proportion as the chick requires a more and more free admission of air into its prison, so a more and more free admission is gradually effected, till at last, before exclusion, its feeble chirp may be heard, proving that the process of respiration goes on freely. In fact, the shell, during incubation, not only becomes lighter, but more brittle, and the lining membrane at the same time becomes partially separated.

If a new-laid or fresh egg be plunged into boiling water, or hot water, its surface will instantly become covered with minute globules of air, escaping through the pores of the shell; and, as the "poultry-maid" tells us, that if, in roasting an egg in the wood-ashes or embers on the hearth (as we have seen done many a time in France), drops of moisture ooze out to the surface, the egg is fresh—two facts, proving the porosity of the shell. Eggs, destitute of shells, are not unfrequently laid; they are called soft eggs. In these cases the hen is weakly, or debarred from calcareous matter, as chalk or old mortar, which is demanded by the system; at all events, the lower portion of the oviduct has failed to secrete the necessary supply of lime.

A perfect egg, when laid, consists, therefore, of the shell with its double lining, inclosing the air-cell; the *albumen*, or *white*, with its *chalazas* or cords, running longitudinally from

an expansion thrown over the yolk, or rather over the *membrana vitelli;* the yolk, invested in its delicate membrane, and exhibiting the germ, the canal, and the central cavity filled with granular matter.

The yolk forms the nourishment of the developing chick. With respect to the white, which consists of two or perhaps more layers, distinct from each other by the intervention of an invisible film, various opinions have been formed. Dr. Paris regards it as designed to regulate temperature: "The *albumen*," he remarks, "being a most feeble conductor of caloric, retards the escape of heat, prevents any sudden transition of temperature, and thus averts the fatal chills which occasional migrations (departures from the nest) of the parent might induce." This is not improbable; but as more than one effect results from single causes in most of the plans and operations of nature, we may adduce two other benefits resulting from the presence of the albumen. First, it acts as a defence to the yolk, allowing it to float at liberty, but beautifully suspended, insomuch that the germ is always uppermost, however the egg be turned about. Were the yolk inclosed only in the shell, this could not take place, and moreover, every slight jar would be communicated to the tender germ. Hence, then, the *white* is essential to the preservation of the yolk and its embryo. Again, there must be room in the egg for the due development of the chick before exclusion. This, for the reasons above stated, independently of others, cannot be effected by the extension of the yolk, so as to fill the cavity of the shell, but most appropriately by the envelopment of the *white*, which acts as a regulator of temperature, and a safeguard in every contingency; it gives amplitude to the shell, it defends the yolk, it insures uniformity of temperature. But we must follow the phases of the germ-bearing egg. It is destined either to become abortive—to perish, or to give to light a living being. Warmth alone is required for the commencement, carrying out, and completion of the process, by which, "*ex ovo*," an active creature will emerge from the tomb.

The changes which the chick undergoes in the egg during the process of incubation, have engaged the attention of many philosophical naturalists, who have given the minute details of every phase. A brief sketch of the mode of development presented by the chick, from the first day of incubation to the twenty-first, is all that we shall here attempt.

After the lapse of about *twelve hours*, during which time the hen has been sitting upon her eggs, a change is perceptible in the appearance of the *blastoderm*, which becomes separate from the *yolk* and the *membrana vitelli*. It has begun to spread, assuming the form of a central pellucid spot, surrounded by a dark ring. It is, moreover, somewhat prominent, and on microscopical examination is found to consist of three layers; of these the external is a *serous layer*, below this is a layer of *vascular tissue*, and beneath this, and next to the yolk, is a *mucous layer*. The spark of life is kindled, for from these three layers the development of the chick proceeds. From the first layer all the serous structures originate, from the second the vascular system, and from the third or innermost all the mucous structures.

At the commencement of the *second day*, the embryo is still more developed, and at its anterior portion the membranes of the *blastoderm* are bent inwards, assuming a *sigmoid* flexure, which at the close of the *second day* becomes still more apparent, while from the *vascular* layer, at its flexure, a little *pulsating cavity* is developed, and this *punctum saliens* is the commencement of a heart.

On the *third day* the *serous membrane* will present a decided alteration in appearance; it extends considerably over the back of the embryo, and is reflected over its two extremities, and forms in fact the commencement of the *amniotic* sac.

The *mucous layer* is no less altered; it extends as a lining along the under surface of the embryo, destined to become the abdominal cavity, and it gives birth to the rudiments of the abdominal viscera.

The *punctum saliens*, given off from the *vascular layer*, is also more advanced in development; it has assumed the character of a heart consisting of two chambers, from which are given off arterial vessels, the branchial arteries, consisting of four arches on each side, which unite to form the *aorta*. In connection with the development of the *aorta*, another change is commencing—the *allantois*, allantoid sac, or sac of embryotic respiration, begins to manifest itself.

On the *fourth day* the pupil of the eye can be distinguished, and also the aqueous and vitreous humours. Five vesicles, filled with a fluid, appear on the head, which afterwards coalesce and form a brain, invested with its membranes. The wings and thighs have begun to bud, and the *allantois*, or vascular membrane, proceeding from the navel, is developing.

The spine assumes a distinct form, and the double cord of the spinal marrow is apparent.

At the *fifth day* the lineaments of the viscera become tolerably distinct, the sac of the *amnios* is completed, the liver and the lungs are clearly discernible, and the bag of the *allantois* is largely developed. Still, however, the heart is that of a fish, and the aorta is formed by the union of the branchial arches. As, however, the lungs increase in size, the circulating apparatus becomes greatly changed, and the branchial organs obliterated, the heart by degrees assumes its true form, with its ventricles and auricles, and its system of arteries and veins. At this period a *true* aorta does not exist, nor is a *pulmonary* artery yet established. The *present aorta*, as in fishes, is formed by the union of the branchial vessels, and the heart is imperfect. Its perfection is gradual, and completed only after the chick has breathed for a few minutes the atmospheric air; when the *ductus arteriosi* become imperforate, and a distinct *system* and *pulmonic* circulation are established. We might indeed here pause to trace out, step by step, the wonderful metamorphosis which takes place in the vascular system of the chick, from its incipient stages till it leaves the egg; but as this plan would lead us too far from our main subject, and involve our readers in a labyrinth of anatomical details, we shall forbear—we can only generalize.

On the *sixth day* the embryo has acquired a still further degree of development, which continues till, on the *ninth* day, the bones begin to be formed, and the yellow vessels on the yolk bag show themselves. The yolk constitutes the food of the chick. "About the hundred and twentieth hour from the commencement of incubation, the *vascular* layer of the *blastoderm* has spread extensively over the yolk, and as the vessels formed by it become perfected, they are found to converge to the navel of the embryo, and to constitute a distinct system of arteries and veins (the *omphalo-mesenteric*), communicating with the aorta and with the heart of the fœtus, and forming a vascular circle surrounding the yolk. The *omphalo-mesenteric* arteries, which thus ramify over the vitelline sac, are derived from the mesenteric arteries, and the blood distributed through them is returned by the *omphalo-mesenteric* veins to the superior *vena cava* of the young chick.

"As soon as the intestinal system of the embryo bird is distinctly formed, the *membrane* inclosing the *yolk* is seen to communicate with the intestines by a wide duct (*ducto vitello*

intestinalis), whereby the nutritive substance of the *yolk* enters the alimentary canal to serve as food, and the mucous membrane lining that which incloses the yolk (or the *vitellicle*) becomes thrown into close wavy folds, so as to present a very extensive surface. Gradually, as growth advances, the yolk diminishes in size; and at length, before the young bird is hatched, the remains of it are entirely withdrawn into the abdominal cavity, where its absorption is completed; but even in the adult bird, a little cœcal appendage or diverticulum indicates the place formerly occupied by the *ductus vitello-intestinalis*.

"While the above phenomena are in progress, another important system of vessels, provided for the respiration of the bird *in ovo*, is developed, and obliterated before the egg is hatched. About the fifth day the sides of the abdominal cavity, which is still open anteriorly, are occupied by transitory secreting organs, named *corpora Wolfiana;* these apparently are the rudiments of the genito urinary system, and to receive their secretion a bladder is developed, called the *allantoid sac*, a viscus which is moreover destined to play an important part in the economy of the embryo, and soon becomes its principal respiratory organ. The *allantois* first makes its appearance as a delicate bag, derived from the anterior surface of the rectum, but it expands rapidly, and soon occupies a very considerable portion of the interior of the egg, until at last it lines nearly the whole extent of the *membrana putaminis* (or shell membrane), and becoming thus extensively exposed to the influence of the air that penetrates the egg-shell, it ultimately takes upon itself the respiratory function. When fully developed it is covered with a rich network of arteries and veins spread upon its surface. The arteries are derived from the common iliac trunks of the embryo, and of course represent the umbilical arteries of the human fœtus: the vein enters the umbilicus, and, passing through the fissure of the liver, pours the blood which it returns from the *allantois* in an arterialized condition into the inferior *vena cava*, as does the umbilical vein of mammalia."—JONES.

If on the *twelfth* or *thirteenth* day, this allantoid membrane enveloping the *white* of the egg be examined, by very cautiously opening the shell, it will present one of the most splendid spectacles that can be imagined—the most simple, and at the same time, the most perfect substitute for the

lungs. It exhibits a surface covered with countless blood-vessels, venous and arterial, branching through its tissue. The veins are of a bright scarlet colour, carrying oxygenated blood to the chick, while the arteries on the other hand are of a livid red, bringing the carbonated blood from the body of the chick to be renovated and purified on this temporary pulmonic membrane. Thus the functions of the two sets of vessels are subservient to the rapid growth of the inclosed embryo, of which the limbs, the head, the beak, and the feathers, are now shooting forth vigorously.

Still, though the lungs are now in a forward condition, they have not yet taken in air; but on the eighteenth or nineteenth day of incubation, the air-vessel at the large extremity of the egg becomes ruptured, the chick feels the stimulus, it takes an inspiration, it begins to breathe, and utters a chirping sound distinctly audible. From this moment, the circulation begins to flow in a new course. It diminishes by degrees in the *allantois;* this membrane is no longer of importance: it has performed its task, and the lungs have commenced theirs; consequently its obliteration now begins, and is continued until a ligamentous remnant, called the *urachus*, is all that remains to indicate its previous existence. The twenty-first day arrives; the chick is about to emerge from its living tomb. But what is its position in that oval case, and by what means does it emerge into this "breathing world," there to pass its allotted date of active existence?

The chick (to answer the first question) is packed in its shell in the most snug and compact manner imaginable. It is rolled up almost like a ball; the legs, occupying the narrower part of the shell, are drawn up, and the neck is bent down, with the head thrust under the right wing, the tip of the bill emerging, and just touching the shell, near the magnitude of the large or obtuse end. Thus boxed up, the chick, with its beak applied to the greatest circumference of the shell, is, strange as it may seem, in a position most favourable for self-extrication; for, contrary to what some suppose, the chick frees itself by its own exertions, and not by the aid of the mother, as many have imagined from the fact that pieces of the shell are often broken off while the membrane within remains still unruptured. But this results from the circumstance of the membrane being yielding and elastic, while the shell is rendered thin and brittle by the process of incubation; the latter, therefore, breaks while the membrane stretches.

Although Albertus Magnus, a naturalist of the thirteenth century, seems to have understood the mode in which the chick makes its exit, still it was reserved for later zoologists to demonstrate the process. It might be supposed, that the labour of breaking forth from the shell was much above the strength of the yet feeble chick; and so, perhaps, it would be, did not circumstances conspire to render the chick, feeble as it may be, still adequate to its instinctive task. Its position, as we have intimated, gives it an advantage; its beak, although soft, is applied to the part of the egg most liable to yield; but, what is more, it is furnished with a little appendage, which greatly contributes to its efficiency. The use of this appendage was first, if we mistake not, pointed out by that observant naturalist, Mr. Yarrell. "Upon the curved part of the upper mandible, just above the point, there will be seen a small horny scale, nearly circular, having at its centre a hard and sharp projecting point. By the position of the head, this sharp point is brought into constant contact with the inner surface of the shell." When the chick escapes, and the beak hardens by exposure to the air, this hard-pointed scale soon falls off; and on the second or third day, a light-coloured mark only is observable on the spot it had occupied. In pigeons and other birds, which are far less mature than the young fowl when excluded from the egg, and which remain long as nestlings, this horny point remains for six or eight days. It is very probable, as Mr. Yarrell observes, that the hardness of this bill-scale may be proportioned to the thickness of the shell; for in the chick of the Egyptian goose it is not only extremely prominent, but very hard and sharp. It is worthy of remark, that on the beak of the very young ornithorhynchus (an ovo-viviparous quadruped, *monotremata*) a similar horny scale exists.

In its natural position within the egg, the chick lies with the point of its beak uppermost. At first, the superior weight of the body on the contrary side will naturally, though the egg may be turned, cause the chick to revolve; but afterwards, when the chick is ready to break the shell, it has the power of altering its own position, as far as a revolution from left to right is concerned, without a reverse of relationship to the shell. It can, in fact, work at the shell in a circular method, not by pecking so much as by scraping with the bill-scale, the head under the wing being moved backwards and forwards.

Réaumur, who conducted many experiments with a view to elucidate the history of the chick *in ovo*, states that he has frequently heard the imprisoned creatures at work upon the shell with their beaks; and in the more advanced stages of the operation, he could see them with considerable distinctness, by the aid of a candle, through the shell and transparent membrane. In due time, a small crack is produced—though, as yet, the membrane is unbroken; and this crack is gradually extended, till the circle is complete or nearly so, and the membrane also ruptured. During this process the chick gradually turns round, applying its bill in regular progression to the circumference of the shell, cutting, or rather chipping, it directly across. The revolution, as already stated, is from left to right, and appears to be performed by the efforts of the legs, aided perhaps by a wriggling movement of the body generally. Réaumur was inclined to think that the reaction or pressure resulting from the strokes given by the bill upon the shell would be sufficient to produce a gradual alteration in the position of the chick; but he was obliged to alter his opinion—experiment proved it erroneous.

In a state of nature, we suspect every bird, while a chick in the egg, performs according to its species the operation necessary to extricate itself in a definite or determinate time. In domestic birds some little variation may be expected, according to the vigour of the chick, which depends greatly upon the health and condition of the parents. Certain it is that all chicks (we allude to those of domestic poultry) do not produce the same result in the space of time, the period of labour within the shell varying from one, two, or three hours, to more than twenty-four. "I have seen," says Réaumur, "chicks continue at work for two days together; some work incessantly, while others take rest at intervals, according to their physical strength. Some, I have observed, in consequence of their impatience to see the light, begin to break the shell a great deal too soon; for, be it observed, they ought, before they make their exit, to have within them provision enough to serve for twenty-four hours without taking food; and, for this purpose, the unconsumed portion of the yolk enters through the navel. The chick, indeed, which comes out of the shell without taking up all the yolk, is certain to droop and die in a few days after it is hatched. The assistance which I have occasionally tried to give to several of them, by way of completing their deliverance, has afforded

me an opportunity of observing those which had begun to break their shells before this was accomplished; and I have opened many eggs much fractured, in each of which the chick had as yet much of the yolk not absorbed. Besides, some chicks have greater obstacles to overcome than others; since all shells are not of an equal thickness, nor of an equal consistence, and I think it probable that the same inequality takes place in the lining membrane. The shells of the eggs of birds of various species are of a thickness proportionate to the strength of the chick that is obliged to break through them. The canary bird would never be able to break the shell it is inclosed in, if that were as thick as the egg of a barn-door fowl. The chick of a barn-door fowl again would in vain try to break its shell if it were as thick and hard as that of an ostrich; indeed, though an ostrich ready to be hatched is perhaps thrice as large as the common chick, it is not easy to conceive how the strokes of its bill can be strong enough to break a shell thicker than a china cup, and the smoothness and gloss of which indicate that it is nearly as hard, sufficiently so to form, as may be often seen, a firm drinking-cup. It is the practice in some countries to dip the eggs into warm water at the time they are expected to chip, on the supposition that the shell is thereby rendered more fragile, and the labour of the chick lightened. But water, even at the boiling point, does not render the shell more fragile; and though the water should soften it, upon drying in the air it would become as hard as at first." The action of warm, or even of boiling water, upon the egg is ineffectual as far as the softening of the shell is concerned; but, as we have already observed, the shell becomes thinner and more brittle during incubation, and consequently more ready to yield to the efforts of the inclosed chick; insomuch that, if it be not completely separated into two parts before the chicks attempt to emerge, the end, or lid as we may term it, readily gives way before the efforts of the little prisoner as it pushes itself forwards. Generally the anterior part of the shell is thrown on one side, but not always.

Let us now suppose that the chick has opened the door of its egg. Feeble trembler, on the verge of an unknown state of existence, what are its sensations! Had it but reason, how applicable to it would be Buffon's eloquent description of man, springing up at the bidding of his Creator into life and light, at once enraptured, perplexed, and bewildered. But

the chick is guided by instinct, and by instinct alone; it has nothing to learn, no ideas to be conceived through the medium of the senses, and yet it is interesting to watch it at this juncture. It is free; the first thing it does, while yet on the threshold of the egg, is to draw its head from under its wing, and to direct it forwards, the neck trembling beneath the weight which it has now for the first time to sustain. With its neck stretched forwards, and scarcely able to raise itself on its legs, it rests for a few minutes, till its strength be recruited; the fresh air revives it, it raises itself up, it lifts its head, it turns its neck from side to side, and begins to feel its innate powers. Its downy plumage, the precursor of feathers, being wet with the fluid of the egg, lies close to the skin, in stripes down the body and on the wings; besides, it is not yet fairly free from the sheath in which every plumelet is inclosed. As it dries, every tuft expands, or opens, like a feathery flower; the little membranous sheaths split and fall off; and the chick rises in its nest, clothed with a downy garment of exquisite delicacy.

Occasionally perhaps, among wild birds there occur instances in which chicks perish in the egg, unable to extricate themselves from the shell and membranes—we say perhaps—but if our own experience does not deceive us, such instances not unfrequently occur; the chick is dried or glued to its shell, and, unless assistance be given, will infallibly perish. In the case of the wild bird assistance is out of the question; but in her great course, Nature designs the strong alone to live and perpetuate the species. If this accident occurs among wild birds, much more frequently, as might be expected, does it occur among our domesticated stocks. The later eggs of a hen are more liable to this casualty than those laid at the commencement of the season.

We have attributed the casualty in question to debility in the chick, and this we believe to be the source of all the mischief; but this debility is not always innate: it may be the result of injudicious interference. An experienced poultry-maid, giving directions to her young successor, may be supposed to say as follows:—Do not meddle with the eggs or the nest; the hen knows better than you if, and when, they require turning, and in what position to place them. She will seldom forsake them, or leave them long enough to be addled, which is caused by the change from heat to cold. Watch patiently and quietly. On the eighteenth or nine-

teenth day, if you put your ear to the egg, you will hear the chick making a gentle piping noise, and at this time the yolk, which has already begun to be taken up into the body, is now in a state of rapid absorption, being destined to supply the chick with nourishment, even after its exit from the shell. You will very seldom have occasion to assist chickens in emerging from the shell, and the chances are, that you will injure them if you attempt it. Act cautiously, but believe that nature does the business best. Some chickens get out in an hour, others in two or three, and it may happen that some may be a day, or a day and a night at work, by starts. For twenty-four hours you should leave them to themselves; if they are not able to break through their shell-work wall, they will not be stout enough to live, and this is the reason why, even with the gentlest assistance, they very seldom *do* live, supposing they have not left the egg by their own efforts. It sometimes happens that the feathers are glued to the lining of the shell, which prevents the bird from clearing itself of it. In this case be very gentle with your fingers, when you draw the feathers from the lining of the shell. You should go to work as if you were removing a blister from your own skin, that is to say, with the greatest tenderness. Be rather tardy than premature; "let patience have her perfect work." Remember that, if the chickens leave the shell before they have taken in, or drunk up all the yolk, which must serve them for food during the ensuing twenty-four hours after they see the light, they will pine away and die in a few days. Beware, then, of being premature in any efforts, however well-intentioned, to extricate a feeble chick; nevertheless, be watchful, and ready for every emergency.—So far we may say an experienced poultry-maid would give her directions. But now comes another point to be considered. The chickens are all hatched under favourable circumstances; there is no mishap; one after another extricates itself—what is the treatment to be pursued? Many persons, as the chickens leave the eggs, remove them one by one, and place them in a basket, covered up with flannel, and keep them in a warm place, returning them to the hen when the last has made its appearance. This is not generally necessary: it is unnatural, and may fret the hen, who delights in her young brood, whose piping notes, while the chicks were yet in the egg, she has listened to with complacency. The shells, however, should be cleared from the nest; but unless circumstances

render it necessary, the young chickens may be allowed to remain. But suppose that the weather is piercingly cold, and that the hen is restless, then let the chickens have warmth and every attention. Chickens hatched during the winter months require comfortable housing, the hen being with them, and the less that interference be made between the hen and her chicks, the better; they troop around her; she protects them, gathers them under her wings, and watches over them with the most earnest solicitude.

As we have explained, the chick, before its exit from the egg, has absorbed nourishment intended to last for twenty-four hours. If the chicks look healthy, if their downy plumage soon spreads out, and if they gain their feet pretty soon, even though they should not eat, nothing is to be apprehended. In fact, their abstaining from food only indicates the little need they have for it. However, it is well to have all things in readiness for them; twenty-four hours soon pass away, and their wants ought rather to be anticipated than neglected for an hour. The stages of development in which animals are introduced to the world, are very different in different species—but all is in consonance with this law of variation. The young of some birds, for example, are helpless, and require to be fed by the parents for many days, and the parents are led by the impulse of instinct to feed and watch them: not so the young of gallinaceous birds generally; they emerge from the egg highly developed, and have the use of their limbs and beak. They look, indeed, to the mother for protection, but they pick up their own food, and soon become connoisseurs in the selection of it. As soon as chickens begin to feed, they should be *well-fed*. At first crumbs of bread soaked in milk, mixed with boiled rice, and the crumbled yolk of an egg, boiled hard, may be given; a little *under-done* meat chopped very small is relished; and in a day or two grits, oat-cake cut very small, curds, and the like may be given. A shallow pan or vessel of pure clean water should be within their reach; fowls drink freely, and chickens require water often—indeed, they sip the welcome fluid before they begin to *peck*.

Chickens under the guidance of a hen are apt to wander, not from any wandering disposition of their own, but because they follow their parent or protectress, whose discretion is not by any means equal to her zeal or her courage. They thus become exposed to enemies, as the hawk, the weasel, or

the cat; they run the risk of falling into ditches and ponds, or of being saturated with wet—hence something like restriction is imperative. The hen may be placed under a coop, with food and water, in a suitable place, as on a grass-plat, and so kept from straying; the young will not forsake her, they will come to her call, and nestle under her wings on the sudden approach of a shower of rain, or on a change of weather.

The affection displayed by the hen towards her chicks, her anxiety for their safety, and the resolution with which she braves danger in their behalf, need not be insisted on. We have seen a hen at the head of her little troop attack a dog. In due time, however, the hen becomes more and more indifferent to her charge; and when they are strong enough to be independent of her, she abandons them, and generally begins again to lay.

Some persons, especially in France, train *capons* to act as nurses to their broods of chickens which are reared, and some have recourse to *artificial mothers*, or boxes lined with a soft and warm material for the protection of the brood.

With respect to *artificial* mothers, they are undoubtedly useful when there is no natural parent or trained capon to protect and warm the chickens. These *artificial* mothers are nothing more than wooden trays or boxes, so contrived as to impart the necessary heat to the young chickens, after exclusion from the egg, till they are sufficiently strong and grown to need no further assistance. When chickens are hatched by artificial means, as by the *eccaleobion*, or in an oven, these protectors are essential; for, without some substitute for the parent, the chicks would perish. For ourselves, we confess that we look upon *artificial* incubation and *artificial* mothers as among things which may amuse experimentalists, afford gratification to a few ingenious schemers, excite curiosity, but end in nothing. Let us be content with our poultry-yards and their feathered inmates as they are, and be grateful to Providence for the fowls of the air, which are peculiarly the pensioners upon our bounty.

It is a bad practice to under-feed poultry—we should say, that from the very first they should have good and solid food; the store hens, for profit sake, should be got into laying condition as early as possible, and those intended for killing or selling off for the market, should be kept up in good condition, really ready for the spit, and therefore rapid fatteners,

for those who like, as some do, a grease-laden fowl. We do not recommend that the choicest corn should be appropriated to the feathered bipeds of the farm, but we advocate good wholesome grain, which is not little less than mere refuse. How can poultry thrive on a poor diet? Wheat, barley, buckwheat, rye, oats, and oat-meal made into oat-cakes, will form the staple food. Potatoes steamed, mashed with oat-meal, and given warm, constitute a nutritious food; some recommend that the grain, especially the barley, wheat, and rye, be boiled before it is given to the fowls—it swells greatly by this process, and therefore a less quantity in reality fills the crop of the birds; hence it is a saving plan, and much practised in France—but of course the fowls derive less nutriment from it than from the same measure of solid grain unboiled. For example, four pints of barley, when boiled, will fill ten pint measures; four pints of buckwheat will fill fourteen pint measures; four of wheat, ten; and four of rye, fifteen. Now suppose each grown fowl has a daily allowance of a quarter of a pint of grain, exclusive of whatever vegetables, seeds, and insects it may pick up, it follows that the boiled quarter of a pint of wheat will be equivalent to less than one-eighth of a pint of unboiled grain, so that, in fact, the fowl will be cheated as to the quantum of nutriment, though not in the measure of it. It is useless to argue that boiled grain is more nutritious than grain *au naturel*. The human stomach may require it to be boiled, but the digestive apparatus of the fowl is provided with a grinding mill for the express purpose of turning the grain into flour; and hence nature points out what that food should be.

With regard to feeding fowls for the table, much depends on circumstances. Spring chickens may be put up for feeding as soon as the hen ceases to regard them, and before they lose their first good condition. In their fattening pens they will have no opportunity of picking up little pebbles; their mills, therefore, will be inoperative, and the diet must consequently be pultaceous, viz., bread and milk, barley-meal, or oatmeal and milk, the meal of steamed potatoes mixed with barley-meal, with the occasional addition of a few grains of cayenne pepper, as some recommend, or of dried nettle seeds, which the foreign feeders are in the habit of giving. Where chickens have the run of a good farm-yard, and plenty of food, it is a work of supererogation to pen them for fattening; they will be ready at any time for the table,

and their flesh, being in its healthy state, will be sweet and juicy, delicately tender, and sufficiently fat. Some, indeed, prefer fatted fowls, but this is a matter of taste;—to us the greasy fat of poultry is very disgusting. Mr. Mowbray found that pullets hatched in March, and constantly fed upon high diet, not only laid eggs abundantly in the autumn, but were, when killed in the month of February or March following, as fat as any one could have desired them to be, opening, as he says, more like Michaelmas geese than chickens. However, all poultry are not kept upon high diet, hence their fattening is in many instances necessary. For tolerably grown fowls, about three weeks' confinement and feeding will suffice. Many poulterers give grease mixed with farinaceous food very largely, a diet upon which the fowls fatten rapidly, and indeed often become loaded with fat, which makes them look well to the eye; but their flesh, if not disagreeable, is insipid, and altogether inferior to that of a fowl fed well, and running at large about a plenty-stocked barn-yard.

The practice of cramming poultry in order to load their bodies with fat in as short a time as possible, is very common. The poor bird's digestive powers are thus tasked to the utmost—whether at the expense of health or not, let any one determine. However this may be, it is a common course of treatment, and the poultry-feeders about Horsham, in Sussex, and in Surrey, Essex, and Berkshire, will, it is said, fatten each perhaps two hundred fowls, ready for the market, in little more than a fortnight, each fowl weighing from five to seven, or even eight pounds. A full-sized fat capon will weigh from seven to ten pounds.

As fowls are to be killed for the table, it may be as well to point out a merciful way of destroying them,—a point on which few concern themselves. Fowls are never bled to death (like turkeys and geese), as, from the loss of blood, the flesh becomes dry and insipid. Poulterers and higglers either strain at the vertebræ of the neck till their dislocation takes place, or produce the same effect by a sudden twist. The former mode is very cruel; the second plan is more merciful, but is not always skilfully managed, and requires considerable dexterity. The best plan is to take a blunt stick, such as a child's bat or boy's wooden sword, and strike the bird a smart blow at the back of the neck, about the third joint from the head; death follows in a moment.

CHAPTER II.

ON THE STRUCTURE AND HABITS OF GALLINACEOUS BIRDS—THE CHARACTERS OF THE PHASIANIDÆ—AND THE ORIGIN OF THE COMMON FOWL.

It would seem that all attempts, beyond a certain point, to trace back the history of some of our most common domestic poultry, are in vain. The circumstances attending their primeval subjugation are utterly buried in oblivion; nor can we follow them from their native seats, detailing their progress and general diffusion—a point the less to be wondered at when the history of the turkey, a bird introduced from America into Europe, somewhere about the beginning of the sixteenth century, is involved in doubt and difficulty. The same obscurity, then, which hangs over the early history of our domestic quadrupeds, hangs over that of our domestic birds, nor can we hope ever to dissipate it.

Our domestic poultry belong respectively to three distinct orders of the class *Aves*—viz., the rasorial or gallinaceous order, the columbine or gyratorial order, and the natatorial or swimming order. These orders are distinguished from each other by well-marked characters, which are exhibited as much by the domestic as by the wild species included in them. Each order, however, is universally distributed, no country being without some representatives; and these are collected into families, according to their mutual affinities.

ORDER RASORES.

As the term *Rasores* (*rado*, scratch) leads us naturally to conclude, the birds included in this order are chiefly if not exclusively terrestrial in their habits—many indeed roost, for they can hardly be said to perch, on trees; but some, as the partridge, the quail, the red grouse, and others, are absolutely terrestrial, not only scratching for their food, but reposing on the ground. The habits of all animals and their organization and external configuration, nay even their clothing, are in accordance with each other. In birds which make the ground

their province, and emulate neither the dove, the pratincole (*Glareola torquata*), the stone curlew (*Œdicnemus crepitans*), nor the lapwing (*Vanellus cristatus*), in flight, we cannot look for much strength of wing, but we may expect to find the legs well developed, and the thighs muscular. The rasores have in fact a rounded heavy body, covered with loose plumage, which in many instances assumes on the neck or rump the character of plumes, or hackles, and the tail feathers are often singularly developed. The hackles on the neck of the domestic cock, the gorgeous plume of the peacock (its rump feathers), and the elongated tail feathers of the pheasant, and others of the genus *phasianus*, are examples in point. The wings, as a rule, are short, rounded, and concave underneath, the quill feathers are feeble, and the *os furcatum*, or merrythought, a bone which acts like the clavicles in the human subject, supporting the shoulders during the exertion of the pectoral muscles, is weak and undeveloped. It is peculiarly so in the turkey. In some rasorial birds, however, as the grouse, ptarmigan, &c., the wings, though short and concave, have much firmer quill feathers, and the *os furcatum* is more developed. These birds fly for comparatively short distances with great rapidity, but they also run with ease and celerity on the ground.

As organs of progression, the legs of the rasores take a far higher rank than the wings. The rounded full-made body is nicely balanced upon them; the thighs are powerful, the tendons of the muscles inclining to become osseous; the tarsi or shanks are long and stout, and covered anteriorly with broad hard scales; in the males of many species they are armed with a horny spur, and in some with a double spur; rudiments of the spur are apparent in the tarsi of the females, and occasionally these weapons become considerably developed; the toes are three before, united at their base by a short membrane, and a short posterior toe seated high up on the tarsus—little more than its tip touching the ground during progression: the toes are covered above with broad scales, but beneath, the tough skin is protected by hard granulations; they are furnished at the extremity with strong blunt nails or claws, convex above, concave beneath, and well adapted for scraping up the ground in quest of seeds, roots, and insects. The toes have but a feeble power of grasping. While perching, the weight of the body acting on the contractor tendons of the toes, closes them sufficiently for giving

a tolerably secure hold, especially as the body is well balanced; still the hold is destitute of that tenacity which in many other birds is so remarkable.

In looking at the head of the Rasorial Birds, we find the beak stout, of moderate length, with the upper mandible convex above, the nostrils being pierced in a large membranous space on each side at its base. In many species, the head is furnished with naked membranes, in the form of a comb, and wattles or naked skin on the cheeks, or around, or over the eyes, or naked carunculated appendages on the head, and extending down the anterior part of the neck; in some, the base of the beak is surrounded by a naked membrane—in others, the head is crested with feathers, or even galeated with an osseous helmet. In most the trachea is simple, but in the curasrows it is more or less convoluted. The voice is generally harsh or perhaps discordant, never musical, unless the cock's "shrill clarion" may be so denominated. The scream of the peacock, the gobble of the turkey, and the harsh grating voice of the guinea-fowl, are familiar sounds to all. The sternum or breast-bone is deeply notched or indentated on each side of its posterior edge, and the ribs are feeble.

As respects the senses, those of sight and hearing are tolerably acute; but smell and taste do not appear to be at a high ratio, nor indeed is it needful that they should be so. Grains, seeds of various kinds, mast, bulbous roots, berries, the sprouting leaves of vegetables, together with worms, insects, and their larvæ, constitute the food of this group of birds. The young, indeed, feed largely on the larvæ of ants, and on insects generally, picking them up with avidity.

A few observations on the digestive organs of the rasorial or gallinaceous group of birds may be here admissible; and the rather as these parts ought to be understood by all who keep poultry, and who have their assistance frequently called into operation when fowls, as is their habit, over-distend the crop with grain. The œsophagus or gullet leads into a dilatation called the crop, craw, or *ingluvies*—a large membranous cavity, which lies just before the breast-bone, and which receives the food when first swallowed. It is furnished with many mucous and salivary glands, the exudation from which tends to soften the grain, and fit it for farther elaboration. This crop or sack is not very sensible, and when gorged with food may be opened by means of a sharp pen-

knife or lancet, and relieved of its contents. If the edges of the wound be neatly joined together, and secured by a few stitches—the bird being at first kept fasting, and afterwards only allowed a little sopped bread or the like—it will generally recover without any ill symptoms. To this crop succeeds a narrower portion, called *ventriculus succenturiatus*, the lining membrane of which is beset with numerous glandular orifices, forming a sort of belt, which pour out a copious secretion of digesting or gastric juice, which mingles with the food in the gizzard or grinding stomach, into which the *ventriculus succenturiatus* immediately leads. The gizzard is a powerful grinding mill, composed of immensely thick and firm muscles, and lined with a tough insensible coriaceous membrane. The two massive hemispherical muscles which essentially form the grinding apparatus are opposed face to face, like two mill-stones, and they work upon each other, triturating to a pulp the food subjected to their action, and rendering it fit, after being broken down, for the influence of the gastric juice, which, until this takes place, in the case of grain, would have little or no solvent power upon it. To assist in this mill-like operation of the gizzard, graminivorous fowls swallow small pebbles or stones—a practice clearly instinctive, and sometimes carried to a greater extent by domestic fowls than would seem necessary. Nevertheless, without a sufficiency of these pebbles (and fowls should never be so kept as to be unable to obtain them), digestion is suspended, the body derives no nutriment from the food (unless indeed it be macerated or softened), and the bird droops and wastes away. Sir Everard Home, in his description of the gizzard of the turkey, says, "When the external form of this organ is first attentively examined, viewing that side which is anterior in the living bird, and on which the two bellies of the muscle and middle are more distinct, there being no other part to obstruct the view, the belly of the muscle on the left side is seen to be larger than on the right. This appears, on reflection, to be of great advantage in producing the necessary motion; for, if the two muscles were of equal strength, they must keep up a greater degree of exertion than is necessary—while in the present case, the principal effect is produced by that of the left side, and a smaller force is used by that on the right to bring the parts back again.

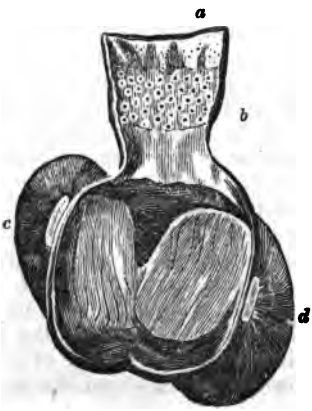
"The two bellies of the muscle, by their alternate action,

produce two effects,—the one, a constant friction on the contents of the cavity; the other, a pressure on them. This last arises from a swelling of the muscle inwards, which readily explains all the instances which have been given by Spallanzani and others, of the force of the gizzard upon substances introduced into it—a force which is found by their experiments always to act in an oblique direction. The internal cavity, when opened in this distended state, is found to be of an oval form, the long diameter being in the line of the body; its capacity nearly equal to the size of a pullet's egg; and on the sides there are ridges in the horny coat (lining membrane) in the long direction of the oval.

"When the horny coat is examined in its internal structure, the fibres of which it is formed are not found in a direction perpendicular to the ligamentous substance behind it; but in the upper portion of the cavity they have a direction obliquely upwards.

"From this form of cavity it is evident that no part of the sides is ever intended to be brought in contact, and that the food is triturated by being mixed with hard bodies, and acted on by the powerful muscles which form the gizzard."—(*Comp. Anat.* i. 316.)

The annexed cut shows the gizzard of the turkey laid open: *a*, lower portion of the crop: *b*, ventriculus succenturiatus, with its zone of glands; *c*, muscle of the left side of the gizzard; *d*, muscle on the right side



Cut of Gizzard of Turkey, laid open to show its internal structure. From Sir E. Home's *Comparative Anatomy*; also in *Faculties of Birds*, p. 117.

We shall not enter into details of the experiments, many of them unwarrantably cruel and unnecessary, which Spallanzani, Redi, Magalotti, and others have instituted, in order to test the grinding and solvent powers of the gizzard. Bullets beset with needles and lancets, jagged pieces of glass, and similar articles have been introduced into this viscus, and in a short time these sharp instruments have been found broken up, and the edges of the glass rounded and smooth, the lining membrane of the gizzard exhibiting no appearance of lesion. Felix Plater found that an onyx swallowed by a hen was diminished one-fourth in four days, and that a louis d'or lost in this way sixteen grains of its weight.

With respect to the intestinal canal, into the duodenal portion of which the food converted into a pultaceous mass passes from the gizzard, little need be said. There are two long cœcal appendages (very small or wanting in pigeons); the liver is furnished with a gall bladder (generally absent in the pigeon tribe), whence the bile is carried by ducts into the duodenum, into which latter the secretion of the pancreas also is transmitted The gallinaceous birds, as a general rule, are polygamous, each male having a harem over which he is the lord paramount. In the wild state, at the commencement of the breeding season, the males take possession respectively of certain beats, from which they drive every rival, or from which they are driven by a more powerful antagonist; at this season, their natural pugnacity is increased, and fierce combats are constantly taking place till the balance of power is established

The males clap their wings, strut about with a stately, measured pace, utter their notes of invitation to the female, and of defiance to all rivals. The care of rearing the young devolves entirely on the females; the males neither assist in making the nest, nor in the labour of incubation; on the contrary, in many cases the females assiduously conceal their nests from the male, lest he should destroy the eggs, which he regards with aversion. This is peculiarly exemplified in the turkey and peafowl. During the winter, the males (their mutual hostility having ceased) usually associate together, but separate in spring, when their warfare is renewed. In some respects the partridge is an exception to the general rule. The males and females pair in February, each male having only one mate. During this

month obstinate contests occur between the males, the victor leading off his prize in triumph. Incubation is performed solely by the female; but she is not deserted by the male, and he unites with her in the care and protection of the brood as soon as it is hatched, and displays the utmost courage and anxiety in their behalf. On the contrary, the wild turkey-cock will kill the young if an opportunity falls in his way; and will break the eggs should he chance to discover them.

The nest of the females of the gallinaceous tribe is rude and inartificial. It is generally placed on the ground, under some covert, by way of concealment. Some of the curassows, however, build their nests on the branches of trees. The eggs are numerous; the young when hatched are covered with down, and after the lapse of an hour or two are capable of running about. They follow the female, to whose varied calls they show instinctive obedience, and gather for warmth and security under her wings. She leads them in search of insects and seeds, which they pick up, not requiring to be fed as do the unfledged nestlings of most birds. She defends them with a degree of boldness the more surprising, as at other times she evinces a natural timidity; and it is only by degrees that her care and anxiety diminish, and ultimately vanish.

We may observe, while speaking generally respecting the habits of the gallinaceous group, that these birds dislike wet and swampy situations; indeed, severe rains are very fatal to young grouse and partridges, and a slight sprinkling will thin the young brood of the turkey. All must have observed how dull and drooping the common fowl becomes during the continuance of heavy rains; how under shelter

> "——the household feathery people crowd,
> The crested cock, with all his female train,
> Pensive and dripping."

The fact is, that their plumage does not well throw off the water. Their hackles become saturated, and their tail feathers drag in the mire. While, however, this openness of plumage renders it unfit to contend against water, it is expressly adapted for a cleansing operation which fowls are often seen to practise, and in which they greatly rejoice. They scratch and wallow in the dust, and throw it in profusion over their plumage, till every feather receives its share.

They then rise, flutter their wings and feathers, so as to shake it off, and with it those minute parasitic insects, to which all birds are more or less liable. They are fond of making dusting-places or excavations in dry, sunny banks, composed of loose sandy earth, and there, while the mid-day rays are glowing, they will spend hours, partly in indolence, partly in revelling in the sand-bath, and scattering its particles over them. This is a luxury to which fowls should always have access. It tends to their health, and to the preservation of their plumage in its native brilliancy. Pigeons, on the contrary, are fond of washing themselves in water, and are indifferent to rain. Sparrows both wash and dust their plumage.

Though the gallinaceous tribe obtain their food on the ground, and build their nests there also, most roost at night on trees, and are even fond of elevated situations. This is remarkable in the peafowl, turkey, and Guinea fowl, and we have known them refuse shelter during the cold nights of severe winters, preferring the exposed branches of trees or the tall gable of some barn or other outhouse. That they should be capable of enduring cold so intense is very surprising, but it proves their hardiness, and their fitness for extensive geographical distribution. Many gallinaceous birds, however, such as the partridge, the red grouse, the ptarmigan, &c., never settle on trees, but seek shelter on the ground, under tufts of herbage or brushwood, sometimes, as in the case of the ptarmigan (*lagopus mutus*), under the snow.

Family, *Phasianidæ*.

Genus, *Gallus*. Generic characters:—Bill moderate, strong, convex above, curved towards the point, naked at the base, and furnished with two compressed caruncles or wattles. Head surmounted with a fleshy crest or comb. Tarsi in the male armed with a long and recurved spur, the hind toe only resting on the ground at its tip. Wings short and graduated. Tail-feathers fourteen, forming two vertical planes, with the under sides of the feathers towards each other, and so making what may be called a folded tail The middle feathers longest, and recurved.

The Common Fowl (*Gallus domesticus*, Ray).—Varying in size, and subdivided into numerous breeds, the result of domestication, the common fowl is almost universally distributed. It has been long domesticated throughout Europe

and Asia. It is kept in abundance by the natives of various parts of Africa, and it has been, within recent times, introduced into America, Australia, New Zealand, and other parts colonized by Europeans. M. Lesson asks if it is not remarkable that the domestic hen, differing in nothing from that of our countries, should be found in all the islands of the South Sea, and among people with whom Europeans have certainly never communicated? Cocks and hens, he tells us, were very common at Oualan, for example, and the natives were ignorant that these birds were good to eat. They were found in the Papuan islands, and, among others, there was a white variety, with all the feathers frizzled. We may easily suppose that these birds came with the early colonists, and were derived from Malaya, Sumatra, &c.

That the fowl was domesticated and extensively spread at a very remote period, is very evident; but it does not seem clear whether it was possessed by the Israelites before the consolidation of the nation under Solomon, when commerce began to flourish, and the arts of life to be strenuously cultivated. After the Babylonish captivity, we cannot doubt that the fowl was among the domestic animals of Palestine; and it is to this bird, most probably, that Nehemiah (B.C. 445) alludes, when in his rebuke he says, "Now that which was prepared for me daily was one ox, and six choice sheep; also *fowls* were prepared for me, and also once in ten days store of all sorts of wine" (v. 18). Antecedently to this period, the fowl was abundant in Persia. Thus Peisthetærus (Aristophanes, *Birds*, 483, *et seq.*) relates why the cock is called Περσικὸς ὄρνις (the Persian bird), and how it reigned over that country before Darius and Megabazus (B.C. 521). Not only do the classic poets and historians speak of the high antiquity of the fowl, but medals and coins proclaim the same, and bear its figure stamped upon them. Nor is its delineation absent on other relics of remote periods

Among the Greeks and Romans, the fowl figured in the public shows. It was dedicated to Apollo, to Mercury, to Æsculapius, and to Mars; and its courage and watchfulness were well appreciated. The Rhodian fowls, and those of Delos, Chalcis, Media, and Persia, were celebrated for their superiority in fight, and for the excellence and delicacy of their flesh. Cock-fighting, as might be expected, was a diversion in consonance with the tastes of the Romans, and they were as much devoted to it as the Malays of the present day,

who will stake all upon the issue of the battle. To the rearing of these birds for the table, the greatest attention was paid by the luxurious. They had their *gallinaria*, and were accustomed to cram their fowls with meal, and keep them in the dark that they might the more readily fatten; nor were the capon (*gallus spado*) and the poularde (*gallina spadonia*) unknown.

The Greek terms ἀλεκτωρ, or ἀλεκτρον, a cock, ἀλεκτορις, a hen, bear allusion to the watchfulness of the fowl, and its matin crow—

> "When the cock, with lively din,
> Scatters the rear of darkness thin."
>
> MILTON.

The words are derived from *a*, priv. and λεκτρον, a bed, and therefore lead us to infer that no native or foreign name was transported into Greece with the fowl, otherwise it would most probably have been retained in a modified form. The origin of the words *gallus* and *gallina* is not very evident. Though the allusions to the fowl in the Old Scriptures are few and unsatisfactory, several most pertinent and striking references to it occur in the New Testament, so that it must have been established in Palestine long before the commencement of the Christian era. In the present day, indeed, more fowls are consumed there, in proportion to the population, than in any European country; and this observation applies equally to Western Asia in general, the fowl and the sheep affording the staple articles of animal diet.

When the Romans, under Julius Cæsar, invaded the shores of Britain, they found both the fowl and the goose in a state of domestication; but these, as well as the hare, were forbidden as food. "Leporem et gallinam, et anserem gustare fas non putant; hæc tamen alunt animi voluptatisque causa" —"They deem it not lawful to eat the hare, the fowl, and the goose; nevertheless, they breed these animals for the sake of fancy and pleasure." We proceed to enumerate the principal species of the genus *gallus*

1. THE GREAT MALAY, COCHIN-CHINESE, or KULM FOWL (*Gallus giganteus*, Temminck).—This gigantic species, more remarkable for stature than for beauty or gracefulness, is a native of Java, Sumatra, and perhaps the Malay peninsula. The male, in his natural attitude, often considerably exceeds two feet in height, from the ground to the crown of the head. The comb extends backwards in a line with the eyes;

it is low, thick, destitute of serrations, and has the appearance as if its ridge had been cut off. The wattles hanging from the under mandible are small, and the throat is bare. The neck is long, and covered with hackles of a pale golden reddish colour, which extend to the upper part of the back. The middle of the back and the lesser wing coverts are of a deep chestnut, and the webs of the feathers are disunited; the greater wing coverts are glossy green; the secondaries and quill feathers are of a pale reddish yellow on their outer webs. The hackles of the rump are long and drooping, and are of a pale reddish yellow. The tail feathers are of a glossy green. The under parts generally are of a glossy greenish black, with high reflections, each feather being of a deep chestnut at the base, producing somewhat of a mottled appearance, especially if the plumage be a little deranged.

The body is stout, and the legs are long, but very robust. In proportion to the size of the body, and length of the neck and limbs, the head seems small, and is far from being pleasing in appearance, the curtailment of the comb and wattles seeming the result of injury or malformation. The gait is heavy and destitute of alertness, and the bird, as we have frequently seen, often reposes resting on the tarsi or shanks, their whole length being applied to the ground. The emu rests in the same manner. The attitude is uncouth, and gives the idea of the bird being oppressed with its own weight. It is very probable that this gigantic fowl (sometimes, we believe, called the Chittagong fowl) is less disposed to mount the trees and roost on the branches than most others of the genus; and this strange attitude may be the ordinary mode of taking repose. The crow of the cock, instead of being a clear ringing tone, heartily delivered, as if in defiance of every rival, like the blast of the knight's clarion on the listed field, is short, hoarse, and monotonous,—more like a croak than a crow. Yet, we believe, the bird is game, and that it is matched in India with others in the arena. The female is considerably less than the male, awkward in figure, and of a general brownish colour. Some persons regard this bird with admiration, and see something grand and striking in its appearance. If grandeur and beauty consist in size, they are right; but if they look for animation, alertness, a proud bearing, a light and vigorous step, and an elegant contour, this bird will not meet their expectations. Crosses between this fowl and other breeds, where increase of size is desirable, might

be advantageous. As to the fertility of the mixed stock no doubt can be entertained, and this fact, if the specific distinctness of the *gallus giganteus* be admitted, is sufficient to prove that closely-allied species may produce a stock capable of perpetuation.

Within the last few years, many of these gigantic fowls have been imported into our country, and are kept by the curious in fancy poultry. They have their admirers; and though we cannot see with them, we blame not their taste. We suspect, however, that in many instances, in which the cocks show a slight serration of the ridge of the comb, that a cross has at some time taken place, to the improvement, in other respects, of this giant race; but on this point we cannot be certain.

This fowl has been long kept in various parts of India in a domestic condition, and is called by Europeans the kulm cock. We understand that this breed or species is kept in the royal aviary at Windsor. It has, however, been long known to naturalists, and was described nearly fifty years since by Shaw.

Here, then, we have one source at least whence some of our domestic stocks have been derived, among which we may here notice the St. Jago fowl of Marsden, so remarkable for height and weight. In this breed the comb, both of the cock and hen, is large and often double, added to which there is sometimes a crest of feathers. Domestication always produces some modifications of structure in animals, and more especially in organs of minor importance, as in the length of the tail and ears, and in the development of various appendages. That the comb of the St. Jago fowl should be large, and often double, is not surprising. Most of our ordinary breeds have a rose crown, yet this development is never found in any wild species. It is the result of domestication, and occurs in a part most liable, as might be anticipated, to change. Of a like nature are the caruncles at the base of the beak, and the naked granular or wrinkled skin (the rose) round the eye of the horseman pigeon or carrier. If the carrier be crossed with any other breed, as the tumbler, the excessive development of the tumid skin at the base of the beak and around the eye will appear in the offspring, only not to so great a degree; and so, if a fowl with a single comb be crossed by one with a double or rose crown, this peculiarity will appear more or less constant in the mixed strain. The

same observations apply to plumage. In the male of one wild species (*gallus Sonneratii*), the feathers of the neck and the shoulders have their shafts expanded into a thin horny plate, with a rich metallic gloss; and we hesitate not to say that, by treatment and by crosses, this specific peculiarity may be obliterated. To the *gallus giganteus*, as its type, we refer the Herat fowl, of which some specimens were presented to the Zoological Society by Keith E. Abbott, Esq.

JAVANESE JUNGLE-FOWL.

2. The JAVANESE JUNGLE-FOWL. (*Javan Cock* of Latham; *Ayam-utan* or *Brooga* of the Malays; *Gallus Bankiva*, Temm). —This beautiful bird is found wild in Java, and is about equal in size to an ordinary Bantam—the black-breasted red varieties of which, with a dark steel-blue band across the wings, it closely resembles The space round the eyes and the throat are bare, the comb is much developed and deeply serrated along the upper ridge, the wattles are rather large. Long, clear, brilliant, golden orange hackles cover the neck and rump. The upper part of the back, over which the hackles of the neck are continued, is bluish black. The middle and lesser wing coverts are of a rich deep chestnut, with the webs of the feathers disunited; greater coverts, steel-blue; secondaries, also steel-blue, with a border of chestnut. The quills are brownish black, edged with pale reddish yellow. Tail, black, glossed with changeable green and blue.

Breast and under parts, black. Contour very graceful, and every action animated and lively.

It would appear that an allied but distinct species exists on the continent of India, distinguished chiefly by its larger size. Of this continental species, Sir W. Jardine states that he has seen three or four specimens, all of which came from India proper. From this, perhaps, may be deduced the black-breasted red variety of our spirited game fowls.

With regard to the Bankiva jungle-fowl, it cannot be doubted that it is the main source, if not the only one, of our Bantam breeds. The very term *Bantam* is sufficient to establish the fact. Bantam is the name of a town and district in the north-west of Java, belonging at present to the Dutch. The town is now fallen into decay, but was formerly a place of great importance, and still boasts of a governor, whose residence is at Sirang, or Ceram, a thriving town some miles inland. The Portuguese, who visited Java in 1511, carried on a great trade from Bantam with Hindustan and China, chiefly in pepper. In 1595 the Dutch established themselves at Bantam, and in 1602 the English erected a factory in the same place, which was the first possession of the English in the East Indies. Of the subsequent predominance of the power of the Dutch, who built the town of Batavia, not far distant from Bantam, this is not the place to speak. From this statement, however, it is evident that the beautiful Bankiva jungle-fowls, reclaimed by the natives, and sold to the British at Bantam, while their factory was established there, were imported into England under the very natural appellation of Bantam fowls. Their elegance and diminutive size rendered them favourites, and in due time the name, belonging exclusively to these birds, came to be conferred on all small or dwarf fowls indiscriminately, whether of this pure breed or otherwise. The domestic Bantam stock, as every one knows, breeds freely with ordinary fowls, the mixed offspring being intermediate in size between their parents; and that the Bankiva jungle fowl will breed with our domestic Bantam race, and with other races, the offspring being fertile, we ourselves can testify. Such birds are common in the gardens of the Zoological Society, and so closely do the offspring of the Bankiva jungle-cock and a brown domestic Bantam hen resemble the wild or original breed, that on more than one occasion we have been in doubt; nor is this to be wondered at—on both sides was the lineage the same.

3. SONNERAT'S JUNGLE-FOWL. (*Coq sauvage* of Sonnerat; *Jungle-Cock* of the English sportsmen in India; *Rahn komrah* of the Mahrattas; *Gallus Sonneratii*, Temminck).

SONNERAT'S JUNGLE-FOWL.

4. STANLEY'S JUNGLE-FOWL. (*Gallus Stanleyii*, Gray, in *Illustrations*).

Under the term "Sonnerat's jungle-fowl," two species of jungle-fowl appear to have been confounded together—at least, by most naturalists—although there can be no doubt of their real distinctness. Colonel Sykes, speaking in reference to the *gallus Sonneratii*, says, "Very abundant in the woods of the western *Ghauts*, where there are either two *species*, or two very *strongly marked varieties*. In the *valleys*, at 2000 feet above the sea, Sonnerat's species is found slender, *standing high* on the legs, and with the yellow *cartilaginous spots* on the feathers even in the *female*.

"In the belts of wood on the sides of the *mountains*, at 4000 feet above the sea, there is a *short-legged variety*. The *male has a great deal of red* in his plumage, which *Sonnerat's has not;* the female is of a reddish brown colour, and is *without cartilaginous spots* at all; in fact, the female of this variety is the *gallus Stanleyii* of Mr. Gray's *Illustrations*." It is apparently to both species that the following observations apply:—"Eggs exactly like those of the domestic fowl in form and colour, but less in size. The wild hen would

appear to sit on a much smaller number of eggs than the domestic, as Colonel Sykes shot a hen upon her nest, in which were only three eggs, and the process of incubation had evidently commenced some days (we must not deduce a rule from an isolated fact). In the craw and stomach of many birds nothing whatever was found excepting the seeds, of a stone-like hardness, called Job's tears (*coix barbata*). Irides, deep orange. The crow or call of this species (both species?) is like that of the Bantam cock." To this is added, "The *domestic fowl* is so abundant in the Dukhun, that in parts of the country not much frequented by Europeans, Colonel Sykes has bought from eight to twelve full-grown fowls for two shillings. Many of the hens, *particularly* in the villages of the *Ghauts*, are *not to be distinguished from the wild bird*, excepting only in the *want* of the *cartilaginous spot* on the wing coverts."—*Proceed. Zool. Soc.* 1832.

In the female of the *gallus Stanleyii* of Mr. Gray, as Colonel Sykes himself has shown, these cartilaginous spots are wanting, and red (as in so many of our domestic fowls) predominates in the plumage of the males. Yet looking among the jungle-fowls for one of the wild types of our domestic varieties, we would not lay great stress on these points, knowing how soon plumage becomes modified by extrinsic causes. We see something of this in the silk fowl and in the frizzled fowl. Nor will this surprise us when we consider that one well-known domestic race is destitute of the tail and caudal *vertebræ*, and that another has the skin and *periosteum* black.

The male of the *gallus Sonneratii* may be described as follows. Size intermediate between that of a Bantam and a game cock; but the general contour is peculiarly light and graceful, and vigour and alertness are displayed in every action. The comb is large, with a sub-serrated ridge, that is, the ridge is but slightly dentated, in comparison with the comb of the *gallus Bankiva*. The wattles are large and double. The hackles of the neck, the wing coverts on the shoulders, and the tail coverts, are dark grayish, with bright golden orange shafts, dilating in the centre and towards the tip into a flat, horny, and very glossy plate. In some of these feathers the shaft takes an elliptical or oar-like shape; in others it puts on the appearance of a long inverted cone, from the centre of the base of which a battledore-like process arises. The substance and appearance of these plates have been, not inaptly, compared to the scarlet wax-like plates which ornament the

tips of the secondary quill feathers of the Bohemian chatterer (*bombycilla Bohemica*). We find a similar structure also in the curled metal-like feathers which form the glossy crest of the curl-crested Araçari (*Pteroglossus ulocomus*, Gould). The effect produced by this expansion of the shafts is at once singular and exquisitely beautiful. The feathers of the middle of the back, breast, belly, and thighs, are of a deep rich gray, with paler shafts and edges. The tail is of a deep rich refulgent green, but the feathers which immediately succeed the hackles of the lower part of the back, and lie against the sides of the tail, are rich purple with a pale yellow edge; those next in succession are golden green with gray edges, and all are glossed with brilliant metallic reflections. Bill, legs, and toes yellowish. When seen in a bright sunlight, the plumage of this elegant bird glitters like gold, and presents a most rich appearance. The female is generally described as destitute of those expanded ornaments to the hackles and wing coverts, which are so conspicuous in the male; and certainly we have not observed them on the specimens which we have seen. That they are present in the females of the *true gallus Sonneratii*, we are assured on the authority of Colonel Sykes, while in the *variety* (species?) with short legs, tenanting the woods on the sides of the mountains at an elevation of 4000 feet, this peculiarity in the plumage is wanting. Is it not therefore to the females of this *variety*, or, as we deem it, *species*, that the following description more strictly applies?

Female less than the cock by about a third, without comb or wattles, but a trace of nakedness round the eye. Plumage without the horny structure which distinguishes that of the male. Upper parts uniform brown; neck feathers with dark edges, those of the back and wing coverts with a pale streak along the shaft; and those of the wings, tail coverts, and tail, waved and mottled with darker pencillings; throat and front of the neck white; feathers of the rest of the lower parts grayish white, edged with dark brown; legs bluish gray.

Sonnerat's jungle-fowl, the jungle-cock of the British, is noted for its prowess and resolution, insomuch that it is anxiously sought after by the cock-fighters in Hindustan, who rely on it for victory when pitted against larger game cocks. It does not appear however that the Mussulman cock-fighters breed this bird in its purity; they seek after the wild birds, which soon become tame. Johnson, in his *Sketches of the*

Field Sports, as followed by the Natives of India, informs us that the Shecarries, a people of low caste in India, gain a livelihood by catching those jungle-fowls, and also other animals.

In general habits and manners the jungle-fowls resemble their domestic relatives; the cock proudly leads his train of females, and vigilantly watches over their safety. On being suddenly disturbed the troop scatters in all directions, seeking safety under covert of the dense brushwood. In spots where they are numerous, the challenging of the cocks to each other may be heard on every side around, and yet such is their cunning, and keenness of sight, that the sportsman, unless he is well acquainted with their habits, is often disappointed in his attempts to get a fair shot.

Many living specimens of the *gallus Sonneratii* have been exhibited in the gardens of the Zoological Society.

Sonnerat, and many other naturalists, have contended that to this species alone are our breeds of domestic fowls to be traced. We think it most probable, notwithstanding the peculiarity of the plumage, and the circumstance of the throat of the female being covered with feathers, instead of being naked and wattled, that the *gallus Sonneratii* has intermingled with other breeds, or contributed to improve them—and among them we would enumerate the breeds of high-spirited game fowls kept for fighting by the Mussulmans of India, and which have been long celebrated; but we cannot admit that Sonnerat's jungle-fowl is the sole origin of the domestic race. The *gallus Bankiva* and the *gallus giganteus* present stronger claims to our notice; nor can we doubt they contribute the groundwork of some of our most remarkable varieties. There are several other species of wild jungle-fowl, to which we shall here only briefly allude, as they are not likely to have contributed to the establishment of the domestic race. One of these is the Bronzed Cock of Sumatra (*gallus æneus*), a fine species, remarkable for a large comb, smooth along the ridge. The neck is not covered with true hackles. Another is the Ayam-alas jungle-fowl or fork-tailed cock of Java (*gallus furcatus*). This species has no true hackles on the neck, and the throat is adorned with a single large wattle only, springing from a central line. An intermediate form between the genera *phasianus* and *gallus*, is presented by the fire-backed pheasant of Sumatra (*Euplocamus ignitus*). It is a very splendid bird, and might perhaps be domesticated.

CHAPTER III.

ON THE PRINCIPAL BREEDS OF FOWLS IN OUR ISLAND; ON THEIR VALUE IN AN ECONOMIC POINT OF VIEW

THE domestic fowl is evidently the oldest, and perhaps the most important, of man's acquisitions from among the feathered tribes, its flesh and its eggs being in all countries regarded partly as delicacies always acceptable, and partly as staple articles of food, at once nutritious and digestible. That a bird which has passed in a domestic state generation after generation for several thousand years, in one country or another, should have branched out into many varieties, will not be surprising—perhaps rather it is surprising that it has not undergone more changes. The varieties, however, are sufficiently numerous, every country having some peculiar to itself, and every breeder founding crosses according to his own fancy—to say nothing of those resulting from chance intermixture. In size, in the colour of their skin and periosteum, in the colour and quality of the plumage, in the form of the tail, or its utter absence, in the form of the comb, in the presence or absence of a plume or crest on the head, in the number of the toes, in disposition, and in the qualities of the hens as layers or sitters, differences more or less striking are to be found Yet amidst all these modifications the characters of the genus are rigidly preserved; save, indeed, in the case of hybrids, which we shall hereafter more particularly notice At present let us take a survey of the varieties in question.

1. The GAME FOWL.—Among the Greeks and Romans, the pugnacious propensities and indomitable courage of animals, whether quadrupeds or birds, never failed to attract attention. The Romans indeed, whose passion for the combats of the amphitheatre was notorious, collected not only the ferocious tenants of the Lybian desert, for the gratification of their blood-thirsty disposition, but bred up dogs for the arena, and even sent authorized officers into Britain for the purpose of securing those terrible mastiffs for which the island was

formerly so celebrated. It cannot be supposed that the combativeness of the game cock (and, we may add, of the quail) was overlooked. Cock-fighting was as much in vogue in Greece and Italy in ancient days, as it was during the last

GAME COCK.

century in Great Britain, and is at present in India, China, Malacca, and the adjacent islands, as Sumatra, Java, &c. The Greeks possessed several renowned breeds of game fowls, and Media and Persia produced others of first-rate excellence. We have already said that, on Cæsar's arrival in England, he found the fowl in a domestic condition; but it is very probable that we owe the game breed to the Romans—for when Britain was a Roman colony, it is not to be supposed that the Romans resident in this island would give up the sports to which they were so passionately addicted; and as they sent British fighting-dogs to Rome, so from Rome might they import their fighting-cocks of Greek or Persian lineage. We do not hear that cock-fighting was practised by the ancient British, but we may be certain that it came into vogue when the British became *Romanized* in tastes, dress, manners, and even in language.

To whatever agency Britain owes the introduction of the game fowl, it cannot be denied that this island has long been the *dilecta sedes* of a race matchless in Europe, and expressly denominated by Buffon the "English Fowl." It is not to be regretted that cock-fighting is prohibited by law, and that the public cock-pits, once to be found in every town, almost in every village, have been abolished; yet, that a general deterioration of the game breed has resulted from this step, which humanity and civilization alike demanded, is obvious to every one capable of forming a judgment on the subject. Such would be the case with our breed of racers, were the trials of the turf interdicted. But though the game breed of fowls is at present generally neglected, it is fortunately preserved by some, not for the sake of fighting, but for its beauty, its purity, and ancient lineage. The late Earl of Derby possessed a breed which had been in the possession of that noble family for many generations, and this breed was sedulously preserved from base alloy. It is a black-breasted red, with a purple band across the wing; and though superior in size to the Bankiva jungle-fowl, it closely resembles that bird in plumage and in elegance of contour.

It is not only for its pugnacious qualities that the game fowl is to be noticed—it yields to no breed, nay, perhaps is superior to most, in the whiteness and sapidity of its flesh; the hens are excellent layers, and the eggs, though of moderate size only, are remarkable for the delicacy of their flavour. The game-cock is very attentive to his female train, and ever ready to do battle in their defence; but not unfrequently he becomes savage and dangerous. We have ourselves more than once been fiercely assailed by a game-cock, and, be it observed, a blow with his spur is no trifle; several instances have come under our notice in which children have been severely injured, and we have read and heard of cases in which children have been killed. From these causes, and from the fact that the young broods, as soon as fairly feathered, begin to fight among themselves with desperate determination, blinding each other, stripping the skin from each other's heads and necks, and killing each other on the spot, many persons object to keep this breed, and it must be confessed that it occasions great trouble; it is not always convenient or possible to separate the young broods; and, as the young cocks and hens fight indiscriminately, it not unfrequently happens that one-half is destroyed in the *mêlée*, while most of

the survivors are so mangled as to render it necessary to put them out of pain, to the mortification of the farmer or breeder of fowls for profit; for not only are the broods lost, but the time also. Fanciers, who keep a small number only of fowls, may manage to rear a young brood by precautions which the farmer cannot put into practice.

Of all the breeds, in our eyes, the game breed is the most beautiful, whether we look to contour or to colouring; the cock carries himself proudly and yet gracefully, his port and bearing proclaim his fiery spirit, his undaunted mettle, which endures even to his last breath; for while prostrate and mortally wounded he will answer the insulting crow of his victorious rival, and make a last effort to revenge himself before the spark of life is extinct. No wonder that the gallant cock should have been chosen as the emblem of courage

KULM OR MALAY FOWL.

2. The KULM or MALAY FOWL.—As we have already said, this bird is the descendant of the *gallus giganteus* of Sumatra. The pure breed is undoubtedly game; but, except as far as size is concerned, has little to recommend it. The hens, however, are excellent layers, and the eggs are remarkable

for their delicacy. In India, or at least in Dukhun (the Deccan), Europeans give this bird the name of the Kulm fowl. What good results would ensue by crossing this breed with others we are not able to say—it is a plan, however, recommended by many practical men, both as a means of increasing the size of some long-established races, as the Dorking, and of obviating the degeneracy which sooner or later takes place in all stocks which are bred regularly in and in.

The Kulm fowl is kept in a domesticated state, not only in India but in the Malay peninsula, and in Cochin-China; it has been long known in England, although it is only within the last few years that much attention has been directed towards it. Some years since, noble specimens from Cochin-China were sent to her Majesty's aviary. These are regarded by some as distinct from the *gallus giganteus*, but we look upon them as a mere domestic variety of the Malay gigantic fowl, a cross of which probably prevails in most of our larger breeds, as the Spanish and Polish. The eggs of the hen are said to be very large, with a chocolate-coloured shell. How far the rearing and feeding of these huge birds would repay the breeder's or poulterer's outlay, has, we suspect, yet to be proved.

3. The Duke of Leeds' Fowl, or Shakebag.—A breed of game fowls of enormous size was, about seventy years ago, established by the then Duke of Leeds, and was formerly in high request, that is, in the days of cock-fighting, when the strength and prowess of a cock was its highest recommendation. The origin of this breed is not known; but it was most probably formed by a cross with the *gallus giganteus;* the male frequently exceeded ten pounds in weight, and to his great strength was added spirit and determination. The breed is now extinct, but is noticed by Mowbray, and by subsequent writers, upon Mowbray's authority. It has been suggested that the name of "Shakebag," commonly given to this breed, arose "from the old practice of cock-fighting, when the fancy used to challenge *all comers*, having their cock *concealed in a bag*, and the tremendous power and size of the Duke of Leeds' fowl proving so superior to those of all competitors, and usually securing conquest, eventually obtained for it the name, *par excellence*, of Shake-bag." A breed seldom becomes extinct without leaving some traces at least of its having flourished. Some years since we became possessed of a game-cock (a black-breasted yellow), of immense size, which had been

reared in the north of Yorkshire. It had come off victoriously in one or two Welch mains, and had given the challenge to all comers with unfailing success. We mention this because we have reason to suspect that the fowl in question was the product, if not of the Duke of Leeds' pure strain, of a decided cross with it. It was by far the largest game-cock we had ever seen at the time, or, excepting the *gallus giganteus*, have ever seen since.

4. The Black Poland Fowl.—This variety is by some called the Paduan Fowl; but why these appellations should be given we do not know. The cock and hen are both of a glossy black, and are of large size; in both the head is ornamented with a spreading crest or top-knot of long white feathers, and the comb is either absent or comparatively small. The hens are excellent layers, and the cock is a resolute bird, though not *game* in the strict acceptation of the term. It is a valuable breed.

5. The White Poland Fowl.—This stock seems to have passed away, but has been described by Aldrovandus. Both the cock and hen were of a pure glossy white, with a large black top-knot. Bechstein notices this breed, but we question if it ever gained a footing in our island. We know it only by report.

THE SPANGLED POLAND FOWL.

6. The SPANGLED POLISH.—Fanciers discriminate between this breed and the spangled Hamburg, although by many they are confounded together. Both are crested, but in the Hamburg there are distinctive peculiarities to be hereafter noticed. The spangled Polish is a very beautiful and valuable bird, and by no means of every-day occurrence. The plumage generally is of a clear orange, with shades of brown and green, every feather being tipped with *white*, so as to produce a spangled appearance. The hackles are green and orange-brown; the thighs black, more or less spangled with golden yellow. The hen is of a golden yellow, shaded with brown, and spangled with *white*. This breed is valuable, not only for its beauty, but for the excellence of its flesh. The hens are good layers, and make attentive nurses.

7. The SPANGLED HAMBURG.—In the spangled Poland of pure strain there is no comb; in the spangled Hamburg there is a small comb, rising up into two, sometimes more, conical eminences or horns, and behind this is a large full pendent top-knot. The wattles are small, and under the lower mandible on the throat is a full dark-coloured tuft of feathers. The general colour is golden or orange-yellow, each feather having a glossy dark brown or black tip (not white), particularly remarkable on the hackles of the cock, and the wing-coverts, and also on the darker feathers of the breast. The female is yellow or orange brown, the feathers in like manner being margined with black. Birds thus coloured are called *golden-spangled*, but there is also a *silver-spangled* variety, differing in the ground colour of the plumage being of a silvery white, with perhaps a tinge of straw yellow, every feather being margined with a semi-lunar mark of glossy black. Both varieties are extremely beautiful, and the hens lay freely. First-rate birds command a high price, and the same observation applies to the spangled Poland.

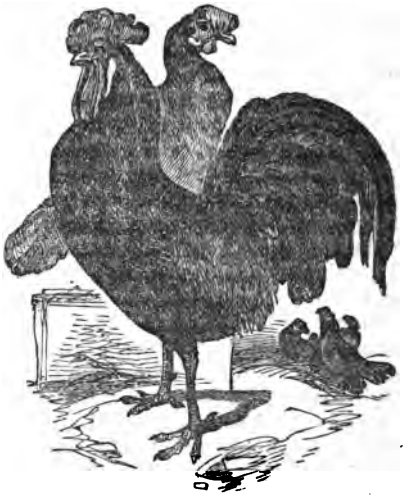
8. The SPANGLED OR DUTCH EVERLASTING LAYER.—In this breed there is no top-knot, but a large and well-formed rose crown, or double comb; the wattles in the cock are greatly developed, and have a decided reduplicature or second fold. The cock is of a general reddish brown, the hackles being of a deep golden yellow, each feather being spangled with black. The hen is yellowish brown, similarly spangled. In this breed, as in the Hamburg, a silver-spangled variety occurs, the general ground colour being white.

This breed, of no common beauty and value, receives its

name from the circumstance that the hens, if properly fed, and kept in a warm situation, protected against the cold, will continue to lay throughout the whole of the year, or nearly so, and thus afford an unfailing supply of eggs. In general, fowls after laying for a certain length of time become *broody*—they cease to lay, and evince an uncontrollable desire, an instinctive propensity, to devote themselves to the task of incubation. They are impelled by the law of nature, which urges them to this essential mode of continuing their race; but in the present breed, in which the season of laying is preternaturally lengthened out, or is almost continuous from spring to spring, this natural desire is greatly weakened, or indeed altogether subdued. The hen betrays no anxiety to incubate, but continues to lay eggs, as if for no other purpose than to repay her keeper. Hence, to obtain a brood of this stock (and it should be kept in its purity), the eggs must be put under a good sitter, of any common breed, a few of which may be kept for the express purpose, and thus the fancier may replenish his stock. It is not often that pure ever-lasting fowls are to be seen, and this renders it the more desirable that those who possess breeds should sedulously preserve them from admixture; a cross will spoil the hens as "ever-lasting layers," without rendering them enduring, patient sitters.

9. The Spanish Fowl.—Like the black Poland this breed is clad in glossy sable plumage, but is not crested with a top-knot; on the contrary, the comb is remarkably large, single, and often pendent on one side; the wattles are extremely developed, and the skin below the ear on each cheek is *white*, contrasting strongly with the scarlet of the comb and wattles, and the glossy black of the plumage. The cock is a noble and stately bird, remarkable for size and height; it is in fact superior in stature to all our domestic races, if we except the Kulm fowl, and at the same time it possesses excellent symmetry. The hen is also of large size and good figure. Brought originally, as it is believed, from Spain, this breed is nevertheless very hardy and well adapted to our climate, and is reared as easily as any of inferior importance. To those who breed fowls for the sake of the flesh and eggs, this fine variety cannot be too strongly recommended. The flesh is delicately white, tender, and juicy, and the hens are free layers. Some persons complain that the hens are far better layers than sitters. Better layers are none, but we cannot say that we

subscribe to this complaint; indeed, a breeder of these fowls, for his own use, in the neighbourhood of the writer, affirms



THE SPANISH FOWL.

that the hens make excellent sitters and nurses, and he has had many years' experience respecting them. The eggs are of very large size, and of first-rate flavour.

Inferior cross-breeds of this Spanish variety are very often to be seen; but such are not worth keeping. Let the pure strain only be adopted; it may be preserved from degenerating by the occasional introduction of males of the same race, and up to the mark in every point, which have descended by a collateral branch from the same root, and which have therefore only a remote connexion with the stock to which they are admitted. It is thus that breeders may often benefit each other by mutual exchanges.

10. The Dorking Fowl.—Surrey is noted for its fowls, especially for that breed which passes under the name of Dorking, and which is cultivated in the district surrounding that celebrated town. The Dorking fowl is a short-legged, plump, round-bodied fowl, remarkable for having five toes,—that is, a supernumerary hind toe. We have indeed seen

some with one or two more supplemental toes, in a rudimentary condition, and which appeared anything but ornamental. The pure Dorking fowl is of good size, and of a white colour, but such are now seldom seen. During a recent visit of some weeks to Dorking, though we visited the market regularly, and explored the country round, on one or two occasions only did we meet with pure white birds. In all, however, more or less white prevailed; but the cloudings and markings of the plumage were unlimited. Many were, as we observed, marked with bands or bars of ashy gray, running into each other at their paler margins. Some had the hackles of the neck white, with a tinge of yellow, and the body of a darker or brownish red colour, intermixed irregularly with white; yet in all were the five claws present. Neither in form nor colouring is the Dorking breed attractive; it is too rounded on the body, and too low on the limbs to be graceful; but its flesh is in high repute, and vast numbers of these fowls are sent to the London market. The breed is of great antiquity, and we fancy that the "couple of short-legged hens" which Justice Shallow of "Glostershire" ordered for the entertainment of Sir John Falstaff, must have at least been closely related to it. Some suppose it to have been introduced by the Romans; of this there is no proof; yet it is certain that a five-toed breed existed anciently in Greece, and is noticed by Aristotle, and that a similar breed existed in Italy in the days of Pliny and Columella. Aldrovandus (16th century) refers to a five-toed variety, which was not uncommon in Italy when he wrote, and we believe that many-toed fowls are to be found in Germany. Is there not, we would ask, a tendency in all short-legged fowls to the growth of supernumerary but imperfect toes? The body is large, the arterial system vigorous, and more blood is transmitted along the arteries of the legs than is simply sufficient for their due development. This results in the partial development of supernumerary or additional parts, where the division into toes at the extremity of the *tarsus* takes place, and might thus occur in breeds otherwise not immediately related to each other. Hence might arise the Dorking variety, irrespective of any Roman lineage. We do not insist upon this view of the subject; yet, that a breed owing its introduction to the Romans should until lately have been so isolated in its locality, is somewhat surprising. Recently it has been introduced into other parts of England, and also into Ireland, and in the latter instance without any

deterioration. It is chiefly for its flesh that the Dorking fowl is valued, yet the hen is an excellent layer and sitter, as in fact all short-legged fowls are; in incubation, indeed, the advantage of short legs is evident; the eggs are in less danger, and less liable to disturbance.

The Dorking breed, more or less crossed, is to be seen in Sussex. In the Sussex fowls the body is more elongated than in the pure Dorking; many, however, are five-toed. We have seen in several farm-yards in Kent flocks of five-toed fowls, differing in no respect, as far as we could judge, from the Dorking, either as respects form or style of colouring, and we doubt not that they were of that esteemed variety, which has now spread to more distant counties. It is asserted that, if removed to an inferior soil or climate, the Dorking fowl degenerates in spite of all care in the breeding; the flesh loses its characteristic superiority, and the hens their character as layers. How far this may be true we have had no opportunity of proving; no fowls prosper in cold, damp, bleak, and exposed situations; moors and mosses, bogs and marsh lands, are not congenial to them, and hence, though the Dorking breed may flourish in Surrey, Berkshire, Sussex, and Kent, it may not thrive in the northern and border counties

11. The Persian or Rumpless Fowl.—This breed, called also the Rumpkin, or tail-less fowl, is supposed by Latham and others to have been brought originally from Persia. It is of moderate size and variable in colour, but is characterized not only by the absence of tail feathers, but of the tail itself, the caudal vertebræ being either wanting, or deficient in number, and rudimentary. There is consequently no tail-gland, which, according to some authorities, secretes a fluid for dressing the plumage and giving the feathers their gloss; of this we are sure, that the feathers of the Rumpless fowl are as bright and glossy as those of any other breed. Some years since we kept a large flock of these fowls, so singular in their appearance, but did not find them profitable. The hens were tolerably good layers, and this is all that can be said; for the flesh was certainly not first-rate. It is a breed by no means to be commended; fowls of the most profitable and valuable description require no more outlay for food than others, and give satisfaction

12. The Frizzled or Friesland Fowl.—This variety, the *gallus crispus* of Temminck, is originally from Eastern Asia, and is often seen in Java, Sumatra, and in India. It is not a

distinct species, but a mere variety, and one moreover unworthy of any attention. In England indeed it is rarely to be met with; it is small, very delicate, and ill-fitted for a humid, changeable climate. It takes the name of *frizzled* (for Friesland is a name given under an erroneous supposition) from the circumstance that all the feathers, those of the wings and tail excepted, are curled up the wrong way, and give the bird an unsightly appearance. A shower drenches it to the skin, and hence the young are reared with difficulty. In one point of view it is interesting, as showing the influence of domestication in modifying the less essential portions of the frame—an influence affecting in fowls the comb, the wattles, the tail, the legs, and, as in the present case, the very character of the feathers.

13. The Silky Fowl.—M. Temminck considered this variety also to be specifically distinct, and has described it as the *gallus lanatus*. It is of small size, and covered with white dishevelled silky feathers, each like a plume of glossy silken filaments. The comb and wattles are of a dark purple, with a tinge of lake, the skin is blue or purple, and the periosteum is dusky black. The flesh however is white, and said to be tender. It comes from Japan and China, but is too delicate for our climate, and is therefore seldom to be seen in Britain. The female is said to lay numerous eggs, but of a small size. This variety readily interbreeds with the ordinary fowl, but the cross is of no value. Here we have another remarkable instance of the extent to which the result of domestication may be carried.

14. The Black Fowl.—This variety is the *gallus morio* of M. Temminck, and has been supposed, but on erroneous grounds, to be a distinct species. It is of moderate size, with variable plumage, and generally a rose comb. The comb, wattles, and skin, are of a dark purple blue, and the periosteum is black. In these points, though not in feathers, it agrees with the silky fowl, and, as we can testify from experience, its flesh is white, tender, and juicy. A gentleman of our acquaintance had several of these birds, which were sent to him from India; he bred from them, and on two or three occasions sent us "specimens," not to preserve, but to eat. A similar breed is said to exist in some parts of Africa, but no individuals from that country have ever come under our notice.

15. The Bantam.—Of the source whence the Bantam breed

has been derived, we have already spoken. Since its introduction into Europe, it has ramified into many varieties, none destitute of elegance, and some remarkable for beauty. All are, or ought to be, of small size, but lively and vigorous, exhibiting in their movements both grace and stateliness.

One variety is remarkable for the tarsi or beams of the legs being plumed to the toes with stiff long feathers, which brush the ground. This variety is less often seen than formerly, perhaps owing to the little care taken in preserving it from admixture. Another variety closely resembles the Bankiva jungle-fowl; it is often red, with a black breast and a single dentated comb. The tarsi are smooth and of a dusky blue. In spirit and courage this sort of Bantam, if pure, yields not to any; it is in fact a game fowl in miniature, and is as beautiful and graceful as it is spirited.

We have seen a pure white kind of Bantam, agreeing except in colour with the foregoing, and we believe that Bantams of this breed are kept in the Royal Aviary, Windsor.

SIR JOHN SEBRIGHT'S SILVER BANTAM.

But the most celebrated and beautiful breed of Bantams is that which Sir John Sebright brought to perfection after years of careful trials. It is very small, with unfeathered legs, and a rose comb and short hackles. The plumage is gold or

silver spangled, every feather being of a golden orange, or of a silver white, with a glossy jet black margin; the cocks have the tail folded like that of a hen, without the usual recurved drooping sickle feathers, or rather these feathers are abbreviated, straight or nearly so, and broader than usual. Hence the term *hen-cocks*, often applied to them. But although the sickle feathers are thus modified, no bird possesses higher courage, or a more gallant carriage. The attitude of the cock is indeed singularly proud, and we have often seen one of them bear himself so haughtily, that his head, thrown back as if in disdain, has nearly touched the two upper feathers (sickles we cannot call them) of his tail Half-bred birds of this kind are not uncommon, but birds of the pure breed are not to be obtained without trouble and expense; indeed, some years ago, it was almost impossible to procure either a fowl or an egg. The finest we have ever seen were in Sir John Sebright's poultry-yard, adjacent to Turnham Green Common, in the bye-road leading to Acton. At the same place were kept several breeds of fancy pigeons, of extraordinary qualities and beauty; and these and the fowls could not but arrest the eye even of the most indifferent. We have seen a description of Sir John Sebright's Bantams, in which the tail feathers and breast are set down as *black*, no allusion being made to the peculiarity of the tail feathers. We suspect the description to have been taken from Bantams which had no claim to the title given them. The tail feathers are not *black*, but partake of the general tint of the plumage, and the breast is golden or silver (as the case may be), beautifully spangled.

As far as regards *practical utility* little can be said in favour of the Bantams, however attractive from their beauty; their eggs, it is true, are delicately flavoured, but then they are too small to be saleable, or worth the farmer's or poulterer's notice. The fact is, that these Lilliputian breeds are in the strict catalogue of *fancy fowls*, among which we may place the almond tumbler pigeon, the fan-tail, the jacobine, and others. They are kept, to use the words of Cæsar, "*animi voluptatisque causâ*."

16. The Russian Fowl.—This variety "is distinguished by tufts of dark-coloured feathers springing from each jaw, and others longer and fuller, springing from the lower mandible in the form of a beard, as in the bustard. The colour varies; some are white, some blue or black, and others are coloured like the game fowl. The flesh of this variety is white and

good. They are likewise good layers, are hardy, and easily fed. Dickson says that they are great favourites in Scotland. At the Royal Dublin Society's Show, April, 1846, specimens of this fowl were exhibited by Mr. Nolan." It appears that this breed is sometimes gold or silver spangled, resembling the spangled Hamburg in markings. This colouring adds to their beauty, and enhances their value.

17. The Barn-door Fowl.—Under this term may be included all fowls which are kept without any particular attention to breeding, or which are the result of various and indiscriminate crossings, and have no fixed standard of colouring, or any distinctive characteristics. Of such in general the flocks of fowls kept by the farmer or the cottager are composed. If they are hardy, have good flesh, and lay abundantly, the great end to be obtained by keeping them is answered. It is no doubt desirable that a little more systematic care should be paid by the farmer than is generally done, that less should be left to chance, and some discrimination exercised in the choice of stock. The importance of poultry is greater than at first sight might appear; consequently, all attempts to establish good breeds, at once hardy, white fleshed, quick fatteners, and abundant layers, are meritorious; nor, indeed, are the efforts of the professed fowl-fancier to be regarded as useless. Were it not for his labours and care, the continuance and improvement of no breed, it is to be feared, would be effected. There would be no stocks to which to apply, by way of correcting the degeneracy of any race. The ordinary standard of size would become diminished, and this perhaps accompanied by a partial loss of fecundity. Besides, the fowl-fancier, whether he knows it or not, is, in the establishment and perfection of his breeds, conducting physiological experiments of no ordinary interest.

We know of no means by which we can arrive even at a rough estimate and value of poultry kept in Great Britain, of the annual value of the poultry consumed as food, or of the number and total value of the eggs produced. Were the figures placed before us (could the amount in pounds and shillings be ascertained), it would perhaps excite astonishment: yet we have but to reflect upon the daily supply demanded by London alone, and to observe how abundantly the demand is met, to feel convinced that many thousands of pounds weekly change hands, in reference to home-bred

poultry, and new-laid or farm-house eggs. But to the consumption of London must be added that of the rest of England, of Wales, and Scotland; and this being done, will it not be conceded that the importance of poultry, in a national point of view, is apt to be overlooked. We look at the value of a single egg, and of a single fowl, forgetting that these are only fractions of an enormous totality, just as a farthing is the fraction of millions of pounds sterling; nor is the comparison inappropriate—for the value of the poultry of Great Britain, at any given time, must amount to more than a million sterling. This property is greatly subdivided; it is in the hands of numerous proprietors, and to each is his portion of peculiar interest. It is astonishing to see the number of fowls, in wooden coops or cages, brought every market-day (Thursday) into Dorking, for sale. Very few are taken back in the evening to the quarters they occupied the day previously. In other towns, as Reigate, Wokingham, or Oakingham, the market is similarly supplied, and the same may be said of other places. In the counties bordering on the metropolis, particularly Surrey, Sussex, Essex, Cambridge, Norfolk, and Berkshire, the rearing and fattening of poultry for the London market is in fact thought worthy of attention by considerable farmers; and now that railroads intersect the country in every direction, the produce of more distant districts may be readily transported to the same all-absorbing city, or to other towns where the demand is active It is indeed a matter of doubt whether England produces home-bred fowls adequate to the unceasing demand in the markets for them. Certain it is that fowls in London are seldom cheap, and often sell at very high prices. Leadenhall market, in London, is the great depôt for poultry, dead and alive, from various parts of the country; they are consigned to salesmen, who transact business with the poulterers, and are as it were agents between the seller and the buyer. Latterly, great numbers of fowls have been sent to the metropolis from Devonshire, and in numerous instances Devonshire houses, as they are called, have been established for the sale of fowls and other produce of that county. These are received direct, that is, without the intervention of salesmen, and return a large profit.

The aim of every one who keeps fowls should be the possesion of a first-rate stock, whatever the breed may be. Every breed has its standard of excellence, and it is desirable

to have that standard raised as high as the most approved system will carry it; hence it is that poultry-shows have been instituted in various counties and towns, and are on the increase. Their object is the same as that of the cattle-shows, with this exception, that specimens of breed, exhibiting the distinctive characters of their race in all their perfection, and combining with these beauty and admirable contour, come in for their share of the prizes. In some cases the show consists of fancy-fowls only; in others, of fowls to be tested by their fattening capabilities—age, diet, and treatment being taken into consideration. We may here advert to the poultry-shows under the direction of the Zoological Society of London, those of the Highland Society of Scotland, those of the Royal Agricultural Improvement Society of Ireland, those of the Royal Dublin Society, and others in various parts of the country. Among the shows more expressly devoted to the display of fattened poultry, we may instance that instituted some years ago at Chapel Bampton in Northamptonshire, by the Earl of Spencer. At a show held in 1829, the prize fowls claimed general admiration for their qualities. The best turkey weighed 20 lbs. 4 ozs., capon 7 lbs. 14½ ozs., pullet 6 lbs. 3½ ozs., goose 18 lbs. 2½ ozs., couple of ducks 15 lbs 10 ozs. Fattened poultry are brought to the show of the Agricultural Association of Cirencester (Gloucestershire), and we have heard of some specimens, remarkable for their weight, having at different times been exhibited.

Martin Doyle, the cottage economist of Ireland, in his *Hints to Small Holders*, observes, that "A few cocks and hens, if they be prevented from scratching in the garden, are a useful and appropriate stock about a cottage, the warmth of which causes them to lay eggs in winter—no trifling advantage to the children when milk is scarce. The French, who are extremely fond of eggs, and contrive to have them in great abundance, feed the fowls so well on curds and buckwheat, and keep them so warm, that they have plenty of eggs even in winter. Now, in our country (Ireland), especially in a gentleman's fowl-yard, there is not an egg to be had in cold weather; but the *warmth of the poor man's cabin* insures him an egg even in the most ungenial season. . . . Wherever you are within reach of steam-boats, you may calculate on having a brisk demand for fat poultry for the English markets, if those at home should not afford a sufficient price.

Many a clever woman in the barony of Forth earns smart sums by rearing and fattening fowl for the Wexford market."

By the advantage derivable from the *warmth of the poor man's cottage*, the writer, we suppose, intends, as is common in Ireland, that fowls, pigs, children, and parents should all herd together around a turf fire, in a smoky cabin, miscalled cottage, which must necessarily be a receptacle for filth and a generator of disease. We by no means agree with him. It is, to say the least, a semi-barbarous plan, and one which no decent cottager in England, however poor he may be, would ever think of adopting. We acknowledge that fowls will not lay in winter without warmth and shelter, and, we may add, good and nourishing food. Warmth may be gained by erecting the hen-house so as to have the advantage of the flue of the kitchen chimney, or apartment in which the fire is kept during the winter—that is, it may be built, where convenient, on the outer side of the cottage, against the kitchen fireplace, the warmth from which will, in general, sufficiently maintain the temperature of the hen-house. The breeds to be selected are the Dutch everlasting layers, the black Poland, the Spanish, or a cross between the Spanish and Dorking. If well managed, the hens of any of these breeds will lay throughout the greatest part of the winter, or even the whole of the winter months. Fresh eggs in winter command a good price, and return an ample profit on the outlay upon food for the fowls. Some interesting experiments, bearing upon this point, have been made by Mr. Mouat, of Stoke, near Guildford. He received three pullets of the Poland breed on the 1st of December, 1835, which had been hatched in June previous, and they commenced laying on the 15th of December. The number of eggs which they laid between the 1st of December, 1835, and the 1st of December, 1836, was 524—that is, 175, 175, and 174 respectively—and one hen only showed a desire to sit. During the twelve months they consumed three bushels of barley, 17 lbs of rice, and a small quantity of barley-meal and peas, the cost of which amounted to 16*s.* 10*d.* The number of eggs being 524, there were thirty-one eggs produced for every shilling expended. Assuming the weight of each egg to be one ounce and a quarter, there would be forty-one lbs. of food, of the most nutritious kind which it is possible to obtain, at the cost of less than 4¾*d.* per lb.; or if these eggs, instead of being used for family consumption, had been sold to the

huckster, a profit would have accrued of at least 100 per cent.; for the trouble of attending to so small a stock of poultry scarcely deserves being taken into consideration. If the barley had been purchased in a larger quantity, it could have been obtained at 4*s.*, instead of 4*s.* 9*d.*, per bushel, and there would then have been thirty-six eggs for each shilling expended.

It must be observed, that during the moulting season in autumn, or at the latter end of summer, hens cease from laying, and in most instances, especially if old, do not recommence till the ensuing spring. There is, however, as we have intimated, a difference in different breeds, and with early-reared pullets, under good management (the breed being one of those above mentioned), eggs may be expected in December, and throughout the winter.

CHAPTER IV.

THE TURKEY.

That it should be difficult if not impossible to trace the progress of the domestic fowl, from its aboriginal seat to the remote regions of Western Europe, will not excite surprise, when we consider the remote epoch at which it became reclaimed, and the many changes of empires, and nations, and tongues, and the loss of records throughout the vast regions of Asia and Europe. But that we cannot fix the precise time, nor can learn any of the circumstances which relate to the introduction of the turkey into Europe, may cause some astonishment, when we reflect that its introduction must have occurred at some period after the conquest of America, and not probably till after a considerable lapse of years, and the establishment of the Spaniards in Mexico. Cortes, in 1519, landed at the place where Vera Cruz now stands; but it was not until after two years of laborious warfare that the Spanish power became in the ascendant, and opened the way for Spanish emigration to Mexico. There is, however, reason to believe, that previously to the Spanish conquest the turkey was in a domesticated condition, both in Mexico and in the adjacent islands; for Oviedo, who embarked for the West Indies in 1514, and resided as governor of the Fort and Harbour of St. Domingo, in the island of Hayti, then called Hispaniola, published among other works (some very voluminous) one entitled *Tradado de la Natural Historia de las Indias*, which was published at Toledo in 1526. In this work he describes the turkey as a kind of peacock abounding in New Spain, whence numbers had been transported to the islands and the Spanish main, and were domesticated in the houses of the Christian inhabitants. It must be observed that he calls the whole of that part of America *las Indias*, the Indies, and also *las Indias Occidentales*, the West Indies (a name still applied to certain islands); hence, perhaps, the terms *Coq d'Inde*, *Gallo d'India*, and *Indianische Hahn*, originally

arose—terms, however, which if they did thus originate, seemed to have conveyed a general idea of this species being the native of Asiatic India; and under this impression, and that it was a bird known to the Greeks and Romans, a bird, as the fable states, into which the sisters of Meleagre were transformed, while weeping for the loss of their brother, it obtained, among the learned, the title of *meleagris*.

With respect to the generic title *meleagris*, adopted by Linnæus, it is now generally received, and any attempt to change it would be useless; this, indeed, is of the less consequence, as it can no longer mislead.

The English name, turkey, it is somewhat difficult to account for, except on the supposition that it was generally believed to come from that country; perhaps, however, it was given because the bird was a stranger, in the same way as we apply the term Goth to men rude and barbarous in their habits, or the term Turk, to persons of a savage and tyrannical disposition; words often become perverted from their original signification, and merge into nicknames expressive of supposed qualities or conditions of things. About the time when this bird appears first to have been known in England, the Turkish power was held in dread in Europe. The sultan, Soliman or Suliman the Great, reigned from 1520 to 1566; his fleet was then the first in the world, and the scourge of the Mediterranean; his ships ravaged the coasts of Italy and Spain, and his armies laid waste the territories of Hungary and some adjacent parts of Germany, and the dread of the Turks was universal over Europe. It might be that the outlandish aspect of this bird, its deep guttural notes, its haughty carriage, and irascible disposition, led to the imposition of the name. But, whatever gave rise to this appellation, certain it is that the present species was the subject of much confusion and doubt among the earlier modern ornithologists, whose learned discussions tended to perplex rather than clear up any points of difficulty. John Walcott, a writer on British birds, 1789, says, "The turkey was first brought to England about the year 1521;" but he gives no authority. It is certain that in the reign of Henry VIII. the turkey was pretty general in England. In his history of the carp (*British Fishes*), Mr. Yarrell quotes an old couplet, which runs thus:—

> "Turkeys, carps, hops, pickerell, and beer,
> Came into England all in one year."

"The old couplet," adds Mr. Yarrell, "is certainly erroneous; pike or pickerell were the subjects of legal regulations in the time of Edward the First. Carp are mentioned in the *Boke of St. Allbans*, printed in 1469. *Turkeys* and hops were unknown till 1524, previous to which wormwood and other bitter plants were used to preserve beer; and the parliament, in 1528, petitioned against hops as a *wicked weed*. Beer was licensed for exportation by Henry the Seventh, in 1492, and an excise on beer existed as early as 1284, also in the reign of Edward the First."

About the year 1524, then, as it would appear, the turkey was introduced into our island, but whether from Spain, or direct from America, we cannot tell. However, the species soon began to multiply, a fact which evinces the attention paid to it; for, as we shall have to notice more explicitly, the successful rearing of broods is by no means easy, from the extreme tenderness of the young. In 1541 we find the turkey enumerated among the luxuries of the table; Archbishop Cranmer (*Leland's Collectanea*) ordered that at festivals there should be no more than one dish of cranes, swans, and turkey cocks. In 1555, two turkeys and two turkey poults were served up at the inauguration dinner of the Sergeants at Law in London; they cost four shillings each, while the swans were rated at ten shillings, and the capons at half-a-crown (Dugdale, *Orig. Jud.*) In 1573, Tusser, in his *Five hundred Points of good Husbandry*, mentions these birds as forming part of the Christmas fare of the farmer. At what period France and Germany received the turkey, we cannot exactly discover, but most probably at about the same period as England. Everywhere its intrinsic value would make it acceptable, and cause it to be treated with the most careful attention.

Although the exact time, and the circumstances under which the turkey was introduced into the various countries of Europe, are in some obscurity, still the wild origin of the domestic stock is not only well known, but still abounds in some of the wooded districts of North America, remote from colonization.

The genus *meleagris* belongs to the family *pavonidæ* of Swainson, and appears to be united on the one side, through the horned pheasant of the Himalaya, genus *tragopan*, to the more typical *phasianidæ*, and on the other to the peacock, and more typical *pavonidæ*, through the Chinese peacock-pheasants, genus *polyplectron*, birds of exquisite plumage.

The genus *meleagris* is thus characterised:—Bill strong, curved, convex, and vaulted; its base furnished with a naked skin; a fleshy caruncle surmounting the bill, of an erectile nature, conical in form, and greatly developed in the male; head and neck surrounded by a wrinkled mammillated or carunculated skin, changeable in its colour from pale pink to scarlet and violet, and hanging in loose folds or racemous clusters over the upper part of the breast; a tuft of long black bristly hairs, or rather hair-like feathers, on the breast of the male, above the upper edge of the sternum; tarsi strong, armed in the male with a short stout spur, which in birds of a year old is merely a rudiment; hind toe touching the ground; middle of the anterior toes much longer and stouter than the two external; claws large, arched, and thick; country, North America, especially the southern and western districts.

Two species only are known to naturalists, viz. *meleagris gallopavo*, the origin of the domestic stock, and *meleagris ocellata*, a bird which, in the metallic splendour and varying tints of its plumage, rivals the peacock.

It is to the former of these species that our chief attention will be directed; but as we cannot omit some notice of the latter, we shall make a few observations upon it before we attend to the common wild turkey, although it is of far more recent discovery, and therefore ought in strictness to be the second in rotation.

1. The Honduras Turkey (*Meleagris ocellata, Cuvier Mém. Mus.* vi. pl., col. 112).

No one who has seen specimens of this splendid bird can hesitate to acknowledge its specific distinctness from the common wild turkey; not more distinct is the golden pheasant from the common, than the Honduras turkey from its more extensively spread relative.

The first specimen which appeared in this country was one exhibited in Bullock's Museum, and which, at the sale of that rich collection, was allowed to pass from England to Paris, and is now in the national museum of that capital. Its capture occurred as follows:—The crew of a vessel were cutting wood in the Bay of Honduras, when three individuals in full splendour made their appearance. One of these they managed to capture alive, and it was destined as a present to Sir Henry Halford. Unfortunately, it met with an accident while the vessel was in the Thames, which caused its death. Sir Henry presented it to Mr. Bullock, who then exhibited

his museum in the Egyptian Hall, Piccadilly. Fortunately, there is at the present time a noble specimen in the British Museum.

The Honduras turkey is inferior to the common turkey in size, nor is the tail so much developed; but what pencil can do justice to its refulgence? The metallic hues and iridescence of its plumage rival those of the humming bird. Except, perhaps, in some of the dense untrodden woods of Yucatan and of Central America, from Cape Honduras to the tenth or thirteenth degree of latitude, north, this bird might be sought for in vain. Even in these countries it is probably rare, excepting in isolated spots, where it roams remote from human habitations. Of its peculiar habits and manners nothing is positively known. We may, however, suppose them to resemble, to a great degree, those of the common species. Could it be naturalized in our island, or in Europe, what a splendid addition we should have to the list of our domestic poultry.

WILD TURKEY.

2. The Common Turkey (*Meleagris gallopavo*).

The wild turkey is a noble bird, far exceeding its domestic relative both in size and beauty. Crosses, however, in America often take place between the wild and tame race, and are highly valued, both for external qualities, and for the table. Indeed, in districts where the wild turkey is common,

such crosses are very frequent, the wild male driving away his domesticated rival, and usurping the sultanship of the seraglio. Eggs of the wild turkey have frequently been taken from their nests, and hatched under the tame hen. The young preserve a portion of their uncivilized nature, and exhibit some knowledge of the difference between themselves and their foster mother, roosting apart from the tame ones; and in other respects showing the force of hereditary disposition. The domesticated young reared from the eggs of the wild turkey are often employed as decoy birds to those in a state of nature. Mr. William Bloom, of Clearfield, Pennsylvania, caught five or six wild turkeys when quite chickens, and succeeded in rearing them. Although sufficiently tame to feed with his tame turkeys, and generally associate with them, yet they always retained some of their original propensities, roosting by themselves, and higher than the tame birds, generally on the top of some tree, or on the house. They were also more readily alarmed. On the approach of a dog, they would fly off, and seek safety in the nearest woods. On an occasion of this kind, one of them flew across the Susquehanna, and the owner was apprehensive of losing it. In order to recover it, he sent a boy with a tame turkey, which was released at the place where the fugitive had alighted. This plan was successful. They soon joined company, and the tame bird induced his companion to return home. Mr. Bloom remarked, that the wild turkey will thrive more and keep in better condition than the tame, on the same quantity of food.

The native country of the wild turkey extends from the north-western territory of the United States to the Isthmus of Panama, south of which it is not to be found, notwithstanding the statements of authors, who have mistaken the curassow for it. In Canada and the now densely-peopled parts of the United States, wild turkeys were formerly very abundant, but, like the Indian buffalo, they have been compelled to yield to the destructive ingenuity of the white settlers, often wantonly exercised, and seek refuge in the remotest parts of the interior. Although they relinquish their native soil with slow and reluctant steps, yet such is the rapidity with which settlements are extended and condensed over the surface of this country, that we may anticipate a day, at no distant period, when the hunter will seek the wild turkey in vain.

The wooded parts of Arkansas, Louisiana, Tennessee, and Alabama, the unsettled portions of the states of Ohio, Kentucky, Indiana, and Illinois, the vast expanse of territory north-west of these states, on the Mississippi and Missouri, as far as the forests extend, are more supplied than any other parts of the Union with this valuable game, which forms an important part of the subsistence of the hunter and traveller in the wilderness. It is not probable that the range of this bird extends to or beyond the Rocky Mountains. The Mandan Indians, who a few years ago visited the city of Washington, considered the turkey one of the greatest curiosities they had seen, and prepared a skin of one to carry home for exhibition.

In Florida, Georgia, and the Carolinas, the wild turkey is not common, and still less so in the western parts of Virginia and Pennsylvania. Some, however, are said to exist in the mountainous districts of Sussex County, New Jersey.

The wild turkey is irregularly migratory, as well as irregularly gregarious. Whenever the forest fruits (or mast) of one portion of the country greatly exceeds that of another, thither are the turkeys insensibly led. By gradually meeting in their haunts with more fruit, the nearer they advance towards the place in which it is most plentiful. Thus, in an irregular manner, flock follows flock, until some districts are deserted, while others are crowded with an influx of arrivals. "About the beginning of October," says Audubon, "when scarcely any of the seeds and fruits have fallen from the trees, these birds assemble in flocks, and gradually move towards the rich bottom lands of the Ohio and Mississippi. The males, or, as they are more commonly called, the *gobblers*, associate in parties of from ten to a hundred, and search for food apart from the females; while the latter are seen either advancing singly, each with its brood of young, then about two-thirds grown, or in union with other families, forming parties, often amounting to seventy or eighty individuals, all intent on *shunning the old cocks*, which, when the young birds have attained this size, will fight with and often destroy them by repeated blows on the head. Old and young, however, all move in the same course, and on foot, unless their progress be interrupted by a river, or the hunter's dog force them to take wing.

"When they come upon a river, they betake themselves to

the highest eminences, and there often remain a whole day, and sometimes two, as if for the purpose of consultation. During this time the males are heard gobbling, calling, and making much ado, and are seen strutting about, as if to raise their courage to a pitch befitting the emergency. Even the females and young assume something of the same pompous demeanour, spread out their tails, and run round each other, purring loudly, and performing extravagant leaps. At length, when the weather appears settled, and all around is quiet, the whole party mounts to the tops of the highest trees, whence at a signal, consisting of a single *cluck*, given by a leader, the flock takes flight for the opposite shore. The old and fat birds easily get over, even should the river be a mile in breadth, but the younger and less robust frequently fall into the water—not to be drowned, however, as might be imagined; they bring their wings close to their body, spread out their tail as a support, stretch forward their neck, and striking out their legs with great vigour, proceed rapidly towards the shore; on approaching which, should they find it too steep for landing, they cease their exertions for a few moments, float down the stream till they come to an accessible part, and, by a violent effort, generally extricate themselves from the water. It is remarkable that, after immediately crossing a large stream, they ramble about for some time, as if bewildered. In this state they fall an easy prey to the hunter.

"When the turkeys arrive in parts where the mast is abundant, they separate into smaller flocks, composed of birds of all ages and both sexes, promiscuously mingled, and devour all before them. This happens about the middle of November. So gentle do they sometimes become after these long journeys, that they have been seen to approach the farm-houses, associate with the domestic fowls, and enter the stables and corn-cribs in quest of food. In this way, roaming about the forests, and feeding chiefly on mast, they pass the autumn, and part of the winter."

The season of courtship begins about the middle of February. The females now separate from the males, whom they endeavour to shun, but by whom they are perseveringly followed.

It is generally about the middle of April that the female begins to select a site, and arrange her rude nest, which consists simply of withered leaves, in some depression on the

ground, amidst dense brushwood, or in such an obscure place as the locality affords. The eggs, like those of the domestic bird, are of large size, and of a dull or cream white, minutely freckled or dotted with reddish brown; their average number varies from ten to fifteen. While the gradual addition of egg to egg is going on, the hen displays surprising instinctive caution. On leaving her charge, she is careful to cover the whole with dry leaves, so artfully disposed, as to render it difficult even for one who has watched her movements to find the nest, and on returning to it she varies her route, scarcely ever returning to it twice by the same course. Hence it is mostly by accident that the nest of the hen is discovered. It not unfrequently happens that several hens associate together and form a common nest, probably for mutual aid and assistance, and rear their broods together. Mr. Audubon says, that he once found three hens sitting on forty-two eggs. In such cases, one of the females at least is ever on guard, no raven or crow then daring to invade it. While in the act of incubation the hen is not readily driven from her nest by the appearance of danger. A person walking carelessly along, as if taking no particular notice, may pass a nest within five or six paces, the female crouching low to avoid observation; but, as Mr. Audubon has ascertained, if a person make his approach in a stealthily searching manner, she will quit it while he is yet thirty yards distant, and assuming a stately gait will move away, uttering every now and then a clucking note, probably hoping by this means to draw off the intruder and baffle his search. We learn from the same writer, that the hen seldom or never abandons her nest if it has been discovered by man, but that, if a snake or any other animal has sucked any of the eggs, she leaves it altogether. Under such circumstances, or when the eggs have been removed, she seeks the male, and recommences the preparation of another nest; but, as a rule, she lays only a single batch of eggs during the season. When the eggs are on the eve of hatching, the female will not leave her nest under any circumstances while life remains; she will even allow an inclosure to be made around her, and thus be, as it were, imprisoned, rather than seek her own safety by flight.

Before leaving the nest with her young brood, the female shakes herself, adjusts her plumage, and appears roused to the exigencies of the occasion; she glances upwards and around her, in the apprehension of enemies, and as she

moves cautiously along, keeps her brood close about her; her first excursion is generally to a little distance only from the nest, to which she returns with her brood to pass the first night. Subsequently they wander to a greater distance, the hen leading her charge over dry undulating grounds, as if aware of the danger of damp and humid spots. Wet, indeed, is fatal to young turkeys while covered only with down; hence, in very rainy seasons the brood become greatly thinned, for the young, if once completely wetted, seldom recover; their vital energies sink under the abstraction of caloric during evaporation.

At the age of a fortnight, the young birds begin to use their wings; hitherto they have rested on the ground, but now they begin to roost on the low branch of some large tree, crowding close to each side of the mother, and sheltered beneath her broad wings. They now wander about more freely, visiting the glades and open lands bordering the woods, in search of wild strawberries and other fruits, grasshoppers, the larvæ of ants and other insects, and roll themselves in the sand and dust, in order to clear their growing feathers of loose scales and parasitic vermin; deserted ants' nests are favourite dusting places.

By the month of August, the young birds have acquired considerable growth, and use their wings and legs with great vigour and readiness, so that they are able to escape the sudden attack of foxes, lynxes, and other beasts of prey, by rising quickly from the ground, and mounting the tallest branches of trees. The young cocks now begin to show their distinctive characteristics, and even to utter an imperfect gobble, while the young hens pur and leap. Several broods now flock together, and so continue united, till after the October migration, and through the winter, when the males leave the females.

The Domestic Turkey can scarcely be said to be divided, like the common fowl, into distinct breeds; there is, indeed, considerable variation in colour, and some little in size, but no Bantam or dwarf race, as far as we have seen, exists. The finest and strongest turkeys are those of a bronzed black, resembling as closely as possible the original stock; they are not only reared the most easily, but are the largest, and fatten the most rapidly. We have seen turkeys of a coppery tint, others of a delicate fawn colour, others parti-coloured, gray and white, and some few of a pure snowy white. We

regard all these as inferior to the black; their colour indicates something like degeneracy of constitution, and we should say that they are seldom very large sized.

To describe the domestic turkey is superfluous; the voice of the male, the changing colours of the skin of the head and neck, his proud strut, with expanded tail and lowered wings jarring on the ground, his irascibility, which is readily excited by red or scarlet colours, are points with which all are conversant. Turkey cocks are pugnacious and vindictive, and often ill-treat the hens; we have known them to attack children, and have witnessed combats between them and the game cock, in which the latter was more oppressed by the weight of his antagonist than by gladiatorial skill;—we have, in fact, seen the bulky hero worsted; he cannot use his spurs with the address exhibited by the game cock, which moreover fights with method.

The adult turkey is extremely hardy, and bears the cold of our winter with impunity; during the severest weather, flocks will roost at night upon the branches of tall trees, preferring such an accommodation to an indoor dormitory. We have witnessed a tall tree crowded on its *higher* branches with turkeys, while on the *lower* branches roosted a flock of Guinea-fowls. The impatience of restraint and restlessness of the turkey render it unfit company for fowls in their dormitory; in fact, the fowl-house is altogether an improper place for these large birds, which require *open sheds* and *high perches*, and altogether as much freedom as is consistent with their safety. Although, as we have said, turkeys will roost even during the winter months on trees, we by no means recommend that this should be allowed; the feet of these birds are apt to become frost-bitten from such exposure to the air, on the sudden decline of the temperature to the freezing point, while a keen north or east wind is blowing; it must be remembered that the domestic turkey, hardy as it is when adult, is not equal in point of endurance to its wild relative, bred in the woods and inured to the elements.

Turkeys are fond of wandering about hedge-rows and the borders of fields; they love to visit turnip fields, where, besides the leaves of the turnips, which they relish, they find insects, snails, slugs, &c., which they greedily devour. In the morning they should have a good supply of grain, and after their return from their peregrination another feed; by this plan not only will the due return home of the flock be

insured, but the birds will be kept in good store-condition, and ready at any time to be put upon fattening diet. Never let them be in poor condition—this is an axiom in the treatment of all poultry—it is difficult, and takes a long time, to bring a bird into proper condition which has been previously poorly fed or half starved.

In the choice of store-birds some care is requisite; the stock should be of a good sort, if possible of the black Norfolk race, produced originally, we believe, by a cross with the wild breed of America. And we may here observe, that could this cross be often repeated (and our wealthy agriculturists should be urged upon this point), not only would our breeds of turkeys become in all respects improved, but the chance of ultimate degeneracy would be obviated. The Irish turkeys are generally very fine, but the French, as far as we have seen (but we may be wrong), are altogether inferior to our best sorts, and are seldom or never to be seen of great weight, that is, averaging from twenty to thirty pounds.

The cock should be vigorous, broad in the breast, clean in the legs, with ample wings, and a well developed tail-plumage; his eyes should be bright, and the carunculated skin of the neck full, and rapid in its changes of colour. Though capable of assuming his legitimate rank among the hens when a year old, he is not in perfection (notwithstanding the contrary opinion of some) until he has attained his third year and is entering upon his fourth, and he continues in his prime for three or four succeeding years. Thus, for two or three or four years, or longer, may all the young cocks be devoted to the poulterer, one perhaps of particular beauty being preserved within that space of time for the ornament of the farm-yard.

The hen should be dark coloured, like the cock—those with white feathers appearing amidst the black plumage should be rejected; her figure should be plump, and her actions lively and animated. The hen breeds when a year old, or rather in the spring succeeding that in which she herself left the egg; but she is not in her prime until the age of two or three years, and will continue for two or three years more in full constitutional vigour. But whether the breeder prefers to keep a store-stock for several years, or prefers a yearly or biennial change, will depend on his views and the general practice of the neighbourhood around him; for ourselves, we should keep a first-rate cock for three or

four years, or even longer, however we might change our store-flock of hens; and, indeed, if these produced first-rate chickens, we should be in no hurry to substitute younger birds in their place. Of course the stock, whatever its prescribed number may be, should be kept up, deficiencies by death and accidents being duly supplied. It would appear that an almost unlimited number of hens may be allowed to a single male.

About the middle of March, generally speaking, the female commences laying; she indicates this coming event by a peculiar cry, by strutting about with an air of self-satisfaction, and often by prying into out-of-the-way-places, evidently in quest of a secret spot for incubation—for her instinctive dread of the male is not removed by domestication, nor has the male lost that antipathy to the eggs which is his characteristic in a state of nature. She should now be closely watched, and some management is required to induce her to lay in the nest assigned to her. The nest should be prepared of straw and dried leaves; it should be secluded; and, to excite her to adopt it, an egg, or a piece of chalk cut into the form of an egg, should be placed in it. When her uneasiness to lay is evident, and symptoms prove that she is ready, she should be confined in the shed, barn, or place in which her nest (in a large wicker basket) is prepared, and let out as soon as it is deposited. It is generally in the morning that the turkey hen lays, and mostly every other day, though some lay daily, until the number amounts to from fifteen to twenty. As the eggs are laid it is as well to remove them (leaving the decoy egg or piece of chalk) until the number is complete, as they are liable to be broken, and to be sucked by rats or weasels. They may then be restored to her for incubation. The turkey hen is a steady sitter, and in this respect resembles the wild bird—nothing will induce her to leave the nest; indeed, she often requires to be removed to her food, so overpowering is her instinctive affection. She must be freely supplied with water within her reach; should she lay any eggs after she has commenced incubation, these should be removed; it is proper, therefore, to mark those which were given to her to sit upon. The hen should now on no account be rashly disturbed; no one except the person to whom she is accustomed, and from whom she receives her food, should be allowed to go near her, and the eggs, unless circumstances imperatively require it, should not be meddled with.

On the thirty-first day the chicks leave the eggs. Now, in a state of nature the wild hen always manages at this juncture far better than she would do if interfered with by man, were his interference possible; and so we believe will the domestic turkey hen, if her nest be placed (and it might be in a certain degree) as it is in nature: this we know, that turkeys which have laid their eggs in out-of-the-way places, and have been allowed to incubate there, have brought their troop of downy younglings into the farm-yard with evident pleasure and satisfaction—no extra attention having been paid to them. It is, however, usual to remove the young chicks one by one as they make their exit, and place them in a basket of warm flannel, tow, or feathers, until all are out, and then to restore them to the hen; this is done as a precautionary measure, lest any accident should happen to them. In a state of nature the turkey only rears one brood during the season, unless her eggs have been destroyed or removed, nor will the domestic hen incubate twice, if allowed to rear her own brood; some, however, who like, as the common phrase is, "to work a willing horse to death," recommend that the turkey be induced to hatch a second time in the season. This is effected by taking her young brood from her as early as possible, and mixing it with another brood of the same age. But we utterly object to this practice—it is cruel, and it taxes the system; she has already sat patiently for thirty days, that is, four weeks and two days, and surely that is quite enough. Besides, the brood thus hatched will be late in the season, and late broods of turkeys are not to be reared without very great care; they cannot stand the chilly mornings of autumn nor the frosty nights, their limbs become swollen and rheumatic, and they die one after another, few surviving, and those few never becoming fine healthy birds from which the breeder would select his stock. Let nature alone. Should a hen lay after hatching her clutch of eggs, and should she (which is very unlikely) indicate a desire for incubation, it is better to prevent her, and use the eggs for household purposes.

The treatment of the chick next demands consideration. We have seen that even the wild chicks are delicate, and unable to endure wet. We may say the same with regard to young grouse and partridges, the flocks of which are much thinned by a wet season. But if the wild chicks are tender, much more so are those of the domestic strain. As in the

case of young fowls, the turkey chicks do not require food for several hours. It is useless to cram them, as some do, fearing lest they should starve; and, besides, the beak is as yet so tender that it runs a chance of being injured by the process. When the chicks feel an inclination for food, nature directs them how to pick it up. There is no occasion for alarm, if for thirty hours they content themselves with the warmth of their parent, and enjoy her care. Yet some food must be provided for them, and this should be, of course, suited to their nature and appetite. Here, too, let the simplicity of nature be a guide. We say this, because some have recommended spices, wine, and even bathing in cold water.

The first diet offered to turkey chicks should consist of eggs boiled hard and finely minced, or curd with bread crumbs, boiled nettles, and the green part of onions, parsley, &c., chopped very small, and mixed together so as to form a loose crumbly paste. Barley or oatmeal, kneaded with a little water, and mixed with the pulp of potatoes and Swedish turnips, to which chopped beet-leaves are added, may be also given. They will require water, but this should be put into very shallow vessels, so as to insure against the danger of the chicks becoming thoroughly wetted. Fresh milk is apt to disagree with the young birds, and is not needful. Both the turkey hen and her chickens should be housed for a few days. They may then, if the weather be fine, be allowed a few hours' liberty during the day; but, should a shower threaten, they must be put immediately under shelter. This system must be persevered in for three or four weeks. By this time they will have acquired considerable strength, and will know how to take care of themselves. On the first drops of a shower they will run for shelter into their accustomed place of refuge, which should be warm and waterproof. As they become older, meal and grain may be given more freely. They now begin to search for insects, and to dust their growing plumage in the sand. At the age of about two months, or perhaps a little more, the males and females begin to develop their distinctive characteristics. In the young males the carunculated skin of the neck and throat, and the horn-like contractile comb on the forehead, assume a marked character. This is a critical period. The system requires a full supply of nutriment, and good housing at night is essential. Some recommend that a few grains of cayenne pepper, or a little bruised hempseed, be mixed with their food. The

distinctive sexual marks once fairly established, the young birds lose their names of *chicks*, or *chickens*, and are termed *turkey poults*. The time of danger is over, and they become independent, and every day stronger and more hardy. They now fare as the rest of the flock, on good and sufficient food, if their keeper is alive to his own interest. Let us again repeat it, that a man who keeps poultry on meagre, spare, innutritious diet, will never rear fine poultry, and never repay himself even for his niggardly outlay. Poultry should never be in bad condition. Let them not be kept at all unless they are kept properly.

Now, as turkeys are reared expressly to grace the board, their mode of treatment for this *finale* requires some notice. Let us take a young poult of three months old, hatched in April, destined to be the head dish of some goodman's table in December. The first part of its education is passed through—what remains? First, then, it will require a mixture of boiled vegetables, as nettles, turnip-tops, cabbage sprouts, and the like, boiled down, and given with meal of various kinds—barley-meal, oat-meal, or wheaten flour, the whole being well blended (with curds if they can be obtained or spared); but with this diet will be mixed pure grain of various kinds—buck-wheat, barley, oats, beans, and (if the plant were largely grown in England) sunflower seeds, not excluding potatoes steamed, boiled carrots, turnips, and the like. The run of a substantial farm-house is the main thing at this epoch. But secondly comes the question, how to prepare for the Christmas market? Some cram their turkeys. The birds should never need this operation. Cobbett says that, as to fattening turkeys, the best way is never to let them be poor. "Cramming is a nasty thing, and quite unnecessary. Barley-meal, mixed with skim-milk, given to them fresh and fresh, will make them fat in a short time, either in *a coop, in a house*, or *running about*. Boiled carrots and Swedish turnips will help, and it is a change of sweet food. In France they sometimes pick turkeys alive, to make them tender; of which I shall only say, that the man who can do this, or order it to be done, ought to be skinned alive himself."

We have never in France seen turkeys so treated, but often pigeons; and on one occasion we remonstrated against this horrible barbarity, but without effect. The poulterer seemed to think that pigeons had no feeling; and so do those who

skin living eels at our door. Cobbett objects to cramming, and not without reason; but then, after all good feeding, cramming is still practised—cramming to finish off good feeding. This is unnecessary; but as weight, irrespective of delicacy of flavour, pays the London poulterer, the heaviest birds are to him the most acceptable. We opine that a medium is to be observed in the preparation of all animals for the market, and therefore think that the cramming of well-fed turkeys is useless. Nevertheless, it is extensively practised. The unfortunate birds are condemned to darkness or twilight. They are forced with balls of barley-meal—sometimes even deprived of sight (horrible barbarity!) There is no necessity that either fowls or turkeys should be blinded and crammed. The whole affair is truly disgusting to any feeling and well-regulated mind. All animals will fatten, with proper food, quite sufficiently for all really useful purposes. According to Mr. Dickson, "no food makes their flesh whiter and more delicate than kitchen-stuff or the dregs of melted tallow, more or less of which must be boiled according to the number that is to be fed; and being diluted in a boiling state, plants (especially nettles chopped up) and pot herbs are to be mixed with it. The whole being well boiled, barley-meal or maize is added, to form a kind of paste, which may be given twice a-day at least—in the morning and at one o'clock—when it is wished to render them fat. But as the dregs of melted tallow are not everywhere to be procured, the dregs or refuse of the oil of nuts, linseed, or sweet almonds may be substituted, the greatest care being taken not to fatten them wholly with such oily substances, for their flesh would partake of the flavour, and be injured." There is no doubt that *greaves*, *oil-cake*, and the like, will render turkeys fat with considerable rapidity; but they should be given sparingly, otherwise the flesh will be rank and disagreeable.

Though the turkey feeds on a vast variety of diet, as mast, corn, sunflower seeds, barley, and oatmeal, green vegetables, snails, insects, &c., still there are some things which, if not positively poisonous, are at least injurious to this bird, and should not therefore be given. We allude to peas, vetches, and tares, and indeed most sorts of pulse. These, says Mr. Richardson, are little less deleterious than such well-known poisons as hemlock, foxglove, or henbane. Yet these form the favourite food of the pigeon.

With respect to the diseases of the turkey, we must refer

to our general observations on the maladies of poultry, having, as far as these birds are concerned, nothing in particular to notice. We have laid sufficient stress upon the care which the young require, and their tenderness until they become poults.

We may conclude our history of the turkey by observing, that extraordinary accounts of the weight of fattened birds sometimes appear either in the public papers or in the works of writers who know nothing personally of the subject. We have been told of turkeys weighing fifty or sixty pounds; and indeed, in the Christmas of 1846-7, we were presented by a relative with a noble turkey, one of his own breeding in Derbyshire. He estimated its weight at twenty-five pounds. On trial it was a little more than seventeen—so easily are persons deceived. Rarely have we seen a turkey of twenty-five pounds, and still more rarely one of thirty. Yet instances have been known in which a prize bird has weighed nearly thirty-five. The large turkeys which are sent from Norfolk, the great county for these birds, at Christmas, are cocks of the preceding year, and are about twenty months old. We received last Christmas a male bird of the year from the Isle of Wight, which exceeded fifteen pounds. We are not, however, aware that the beautiful Isle of Wight is famous for turkeys. As for that, any place in which turkeys are properly reared and fed may compete with Norfolk. We have seen very fine birds in Surrey, and no farther distant from London than in a farm-yard at Barnes. Even in the Peak of Derbyshire, cold and changeable as the climate is, a relative of the writer possessed, when we visited him, as fine a flock of turkeys and Guinea-fowls as any one could have desired; but he took a *pride* in them, and therein lies the great secret of success in the rearing, not only of domestic poultry, but of our domestic quadrupeds also. What is worth doing is worth doing *well*.

CHAPTER V.

THE PEA-FOWL, GUINEA-FOWL, ETC.

THE PEA-FOWL (*Pava cristatus*); Saxon, *pawa;* Belgic, *pauw;* Teutonic, *pfau;* French, *paon;* Italian, *pavon* and *pavone;* Latin, *pavo;* Greek ταών (taon); *mohr* of the Mahrattas.

It is from India undoubtedly that Europe has received the peacock, and that at a very early period. It was well known to the Greeks and Romans. It was the bird of Juno, who adorned its tail with the hundred eyes of Argus—eyes which the poet calls star-like gems,—

> Excipit hos, volucrisque suæ Saturnia pennis
> Collocat; et gemmis caudam stellantibus implet."
>
> OVID.

That the peacock should, in all times, have been admired for its singular beauty is not surprising. When it moves along in state, with its wings lowered to the ground and its tail spread, the rays of the sun glancing upon its gorgeous plumes, iridescent with metallic effulgence, the eye of every beholder is arrested, and all gaze with admiration on the glorious spectacle. When we talk of the peacock spreading its *tail*, we use popular language. The gem-adorned plumes, with their loose silken barbs, are not the tail, but the tail coverts. The tail is beneath these, and hidden by them, and consists of rather short stiff rust-coloured feathers, which serve as a support to the train.

The true tail feathers are eighteen in number, and the head is surmounted by an aigrette of twenty-four upright feathers. The female has the aigrette, but not the splendid colour and ornamental plumes with which the male is gifted. Her colours generally are sombre.

The peacock is too well known to require a detailed description. Pied varieties are not unfrequent in domestication, and we have seen some of a snow-white; but, in our eyes, the most beautiful are those which display their natural colours, unbroken by intermixture.

The peacock is extensively spread, in a wild state, in India and the Indian Islands. It is abundant in the dense woods of the Ghauts, and is readily domesticated, many of the Hindoo temples in the Dukhun, as Colonel Sykes informs us, having considerable flocks of them. On comparing specimens

THE PEACOCK.

of the wild bird with the ordinary domesticated pea-fowl of our country, he found no difference in any respect. "Irides intense red brown," or rather, we should say, blood red.

The wild pea-fowl associates in numbers, and where a favourite feeding ground invites them, hundreds sometimes collect together; but they are very wary, and run with extreme velocity.

Colonel Williamson, in his account of peacock shooting, states that he has seen them in astonishing numbers about the passes in the Jungletery district. Whole woods were covered with their beautiful plumage, to which the rising sun imparted additional brilliancy; he states that small patches scattered about, cultivated with mustard, which was then in bloom, induced the birds to collect there for the sake of feeding on the plant; and he speaks of the beauty of the scene as

enchanting, and so indeed it must have been; for he adds, "I speak within bounds when I assert, that there could not be less than twelve or fifteen hundred pea-fowls of various sizes, within sight of the spot where I stood for near an hour."

There can be little doubt that the splendour of this bird first attracted the notice of the ancients: yet in luxurious Rome its beauty was not its safeguard; on the contrary, it was slaughtered in very wantonness, for the sake of a few parts only, deemed worthy of being introduced as small items in the dishes of royal lunatics or noble madmen,—for such only can we deem them. The sneer of Martial must in his day have been biting; he saw the peacock in its glory, and then beheld it murdered for the sake of its brains. Well might he say—

> "Miraris quoties gemmantes explicat alas,
> Et potes hunc sævo tradere, dure, coquo."

Lines which we may thus paraphrase—

> Oft as the bird his gem-starred plumes displays,
> In admiration dost thou stop to gaze;
> And canst thou then, hard-hearted, take its life,
> And coolly give it to your hireling's knife?

One of the favourite dishes of the Emperor Vitellius, called the buckler of Minerva, was prepared with livers of a choice fish, the scarus, (*scarus Creticus*, Cuvier,) the tongues of flamingoes, and the brains of peacocks. The bird figured also in the feasts of Hortensius, and other sensualists.

In ancient times no great feast in the baron's hall was ever served up without this bird to grace it—it was presented by the sewer, well cooked, on a large dish, but re-arrayed in its glorious plumage; and before the peacock and the ladies did the adventurous knight make his vow.

The habits and manners of the pea-fowl in domestication are well known; it is a rambling bird, unsuited for confined premises; it requires lawns, and shrubberies, and wide pleasure grounds, to which it adds an appropriate charm, whether it moves about with its train expanded, or walks trailing it along down avenues of smooth turf, or amongst the woodland glades. Semi-wild, however, as the peacock is, it is nevertheless disposed to become familiar, and if encouraged will visit the windows of the house in order to receive an accustomed dole of bread, and when displaying its plumage seems to be aware of the admiration it inspires.

Grain of various kinds, mast, fruits, insects and their larvæ, together with small reptiles, constitute its food. It is not until the third year that the male acquires his glorious plumage; the aigrette on the head in this species (but not in another from Japan) is composed of miniature plumes, similar to those of the train. The tarsi are spurred, and when irritated the peacock can use them with full effect.

We have stated that the turkey likes to roost in the high branches of trees: the peacock affects still higher branches, and, failing these, the gable end of a house or barn, or some elevated situation; and here, through summer and winter, will it take its station, defying the rain and the cold. Strange that a bird originally from India should be so hardy! It would seem as if Providence had expressly given to the gallinaceous birds that quality of constitution which fits them for accompanying man into regions far remote from their natural *habitat*. Such is the case, indeed, with all animals essentially subservient to his welfare; and we cannot but see in this fact a proof of the wisdom and goodness of that God who commanded man "to replenish the earth and subdue it."

Though the pea-fowl roosts in trees, the female incubates on the ground, making in her natural state a rude inartificial nest, in some secluded spot under cover of the dense jungle. The eggs vary in number from five to ten. This concealment, as in the instance of the turkey, is necessary; for, actuated by a strange jealousy, the male will break all the eggs if he discover them: and this feeling actuates our domestic birds, insomuch that the female, during incubation, must be placed in such security as to prevent the access of the male to the nest. Eggs, grayish white; period of incubation, thirty days.

Besides the common pea-fowl, a distinct species, the Javanese, or Japan pea-fowl (*Pavo Japonensis*, Aldrovand.; *Pavo Javanicus*, Horsfield; *Pavo muticus*, Linnæus), is occasionally brought to Europe, and might easily be naturalized. This bird is equal in size to the common peacock, and nearly, if not quite, as gorgeous in its plumage. It is a native of Java, Sumatra, the Birman Empire, and Japan, and was first noticed by Aldrovandus (1599); not, however, that he had seen the bird itself, but only two drawings of it sent by the Emperor of Japan to the Pope. The figure given by Aldrovandus represents this species as destitute of spurs (but

erroneously), and on this mistake arose the term *muticus*, applied to it by Linnæus, who himself had never seen a specimen. Subsequently, Shaw described it in his *Zoological Miscellany*, his authority being a drawing sent from India. In the year 1813, M. Temminck gave, in the second volume of his work on Gallinaceous Birds, a sketch of the head, with a description taken by Le Vaillant, from a living individual which he saw at the Cape of Good Hope, whither it had been sent from Macao. It is the *Japan peacock* of Latham, the *pavo spiciferus* of Vieillot, and the *pavo Aldrovandi* of Wilson. Dr. Horsfield found this species in Java, and Sir Stamford Raffles ascertained its existence in the island of Sumatra. Living individuals have been kept in the gardens of the Zoological Society, and both in the museum of that society and in the British Museum fine specimens are preserved.

Though exquisitely beautiful, the Japanese peacock differs very considerably from its common rival. Its prevailing tints are blue and green, varying in intensity, and mutually changing into each other, according as the light falls more or less directly upon them. The crest is twice as long as it is in *pavo cristatus*, and the feathers of which it is composed are regularly barbed, from the base upwards, in the adult bird, and of equal breadth throughout. Head and crest interchangeably blue and green. The feathers of the neck and breast, unlike those in the ordinary peacock, are broad, short, rounded, and imbricated like the scales of a fish. At their base they are of the same brilliant hue as the head, and have a broad, lighter, and somewhat metallic margin. Those of the back have still more of the metallic lustre. A naked space on the cheeks, including the eyes and ears, is coloured of a light yellow behind, and bluish green towards its fore part. The wing coverts are of the general hue, with a deeper tinge of blue. The primary quill feathers are light chestnut. The tail feathers and their coverts, constituting the train, are of a splendid metallic brown, changing into green. Their barbs are extremely long, loose, silky, and somewhat decomposed. Their train plumes are almost all terminated by ocellated spots, similar to those which adorn the train of the common species, and of about the same size. In the centre they are of a beautiful deep purple; this is surrounded by a band of green, becoming narrow behind, but widening in front, and filling up a kind of notch that occurs in the blue; then comes

a broad brownish band, and lastly a narrow black ring, edged with chestnut, all beautifully metallic, or rather presenting the hues of various precious stones when viewed in certain lights. Bill of a grayish horn colour, rather longer and more slender than in the common species. Iris deep hazel. Legs strong and dusky black. Spurs large.

How far this richly-coloured bird differs in habits and manners, while in a state of nature, from the common species, we cannot decidedly say. In captivity, however, it has nothing in these points peculiar to itself, but spreads its plumes, and struts about, as if proud of its refulgent attire.

THE GUINEA-FOWL, OR PINTADO.

The Guinea-fowl, or Pintado (*Numida meleagris*), is undoubtedly the *meleagris* of the ancients, though, as we have already stated, this name has been bestowed as a generic appellation upon the turkey. Nevertheless, as a *specific* title, it is applied to the present bird, and is, consequently, used in two senses, with doubtful propriety. Brisson, indeed, has endeavoured to restore the term *meleagris* in a *generic* sense to the Guinea-fowl, but his nomenclature in this point, though correct, has not been adopted, as it would rather lead to confusion than clear up any difficulty.

The genus *Numida* appears to be exclusively confined to Africa—that is, in a state of nature. It is thus characterized:—Bill stout, short, vaulted, and furnished with a warty membrane at the base; from the lower mandible hang two carunculated wattles; head in some species naked, in others feathered; forehead surmounted with a bony casque, in some species with a feathered crest; nostrils pierced in the cere, and divided by a cartilage; tail short; wings concave, the fourth quill the longest; tarsi spurless. Several species, some of great beauty, are known.

The common Guinea-fowl (*Gallina di Numidia* of the Italians, *Poule de Guinée* and *Peintade* of the French, *Pintado* of the Spanish, and *Perlhuhn* of the Germans) is a native of Africa, where it appears to be extensively distributed. It frequents the open glades and borders of forests, the banks of rivers, and other localities where grain, seeds, berries, insects, &c., offer an abundant supply of food. It is gregarious in its habits, associating in considerable flocks, which wander about during the day, and collect together on the approach of evening. They roost in clusters on the branches of trees or large

bushes, ever and anon uttering their harsh grating cry, till they settle fairly for the night. The Guinea-fowl does not trust much to its wings as a means of escape from danger; indeed, it is not without some difficulty that these birds can be forced to take to flight, and then they wing their way only to a short distance, when they alight, and trust to their

THE GUINEA-FOWL.

swiftness of foot. They run with very great celerity, and are shy and wary, and seek refuge amongst the dense underwood, threading the mazes of their covert with wonderful address. The female incubates in some concealed spot on the ground; for the male, as in the case of the turkey, will break the eggs if he discovers them. This habit, unnatural as it may be deemed, appears to be very common among gallinaceous birds. The domestic cock, however, evidently shares in the triumph of the hen, when she has laid her egg, and answers her peculiar note or cackle of joy.

It cannot be for a moment doubted that the ancient Greeks and Romans were well acquainted with the Guinea-fowl, yet it is not easy to trace out its history. In fact, strange as it may seem, that a bird noticed by Aristotle, Clytus, Pliny, Varro, and Columella, should not, ages since, have pervaded Europe, it is not until after we received the turkey, that the Guinea-fowl became naturalized in Western Europe. Its name does not occur amongst the list of birds appointed to

be served up at the famous feast of Archbishop Neville, in the reign of Edward the Fourth. It does not appear in the Duke of Northumberland's Household Book (1512), nor is it alluded to in the Household Book of Henry the Eighth. Must we not, then, pardon Belon and Aldrovandus for considering the turkey as the *meleagris*, seeing, if our suspicions be correct, that they did not know the Guinea-fowl. In short, from ancient times, through the middle ages, and to a comparatively recent period, we lose all trace of this bird, and, what is more, we appear to have received it, not from Africa, its native country, but from the Western World, to which, with negroes torn from their homes in Guinea and condemned to slavery, it was transported also. This bird is, indeed, so common in America, and several of the West India islands, that some have thought it to be indigenous there; but this is a mistake. In fact, in an old work (*Observ. sur les Coût. de l'Asie*) we are informed that, in the year 1508, or about that time, great numbers of these birds were carried into America by the vessels which traded in slaves; but that the Spaniards, instead of attempting to tame them or render them domestic, turned them at large into the wild savannahs, where they have increased in such prodigious numbers, that they may well appear to be native. They are seen in vast flocks, and are called by the Spaniards and French *maroon pintades—maroon*, or more properly, in modern French, *marron*, meaning fugitive or emancipated.

Though extensively spread, the Guinea-fowl is not even now a very common bird. It is kept in India, but, according to Colonel Sykes, is to be seen only in a domestic state, and is bred almost exclusively by European gentlemen. It thrives, he adds, as well as in its native country.

In England, the Guinea-fowl is less generally kept than the turkey, nor do we think it abundant in France, as far at least as our own observation goes; but it is very easy to be deceived on such a point. We believe that in the colder latitudes of Europe this bird is very rare, and is, in fact, seldom, if ever, to be seen in Sweden, Norway, or Northern Russia. It is not noticed by Linnæus in his *Fauna Suecica*, though he was well acquainted with the species.

Like all the gallinaceous birds, the Guinea-fowl is esteemed for its flesh, and, we may add, its eggs, which, though smaller than those of the common fowl, are very excellent and numerous, the hen commencing to lay in the month of May,

and continuing during the entire summer. Some regard the flesh of this bird as hard and dry, and so indeed that of an old one is; but, after the pheasant season, young birds of the year are by no means unworthy substitutes for that highly-prized game. Such birds are acceptable in the London market, and fetch a fair price. Old birds are worth nothing. The Guinea-fowl is of a wild, shy, rambling disposition; in fact, domesticated as it is, it pertinaciously retains its original habits, and is impatient of restraint. It loves to wander along hedgerows, over meadows, through clover or corn fields, and amidst copses and shrubberies; hence these birds require careful watching, for the hens will lay in secret places; and we have personally known them to absent themselves entirely from the farm-yard, until they returned with a young brood around them. So ingeniously (so to speak) have they concealed themselves and their nest, so cautiously have they left it and returned to it, as to elude the searching glance of boys well used to bird-nesting. There is one disadvantage in this, namely, that the bird will often sit at a late period of the year, and bring forth her brood when the season begins to be too cold for the tender chickens; besides which, a great portion of her eggs will be lost. The best plan is to contrive that the hens shall lay in a quiet, secluded place, and to give about twenty of the earliest eggs to a common hen ready to receive them, and who will perform the duties of incubation with steadiness. In this way a brood in June may be easily obtained. The young must receive the same treatment as those of the turkey; they require a mixture of boiled vegetables, with curds, farinaceous food, as grits, barley-meal, &c.; in a short time they begin to search for insects and their larvæ, and with a little addition to such fare as this, and what vegetable matters they pick up, will keep themselves in good *game-condition*, without cramming or over-feeding; for a week or two before being killed for the table they should have a liberal allowance of grain.

The period of incubation is twenty-six days. One male may be established as the lord of twelve or fifteen females. Though the Guinea-fowl is not an unprofitable bird, seeing that it is capable of procuring almost entirely its own living, still it is rejected by many, on account both of its wandering habits, which give trouble, and its disagreeable voice, resembling the noise of a wheel turning on an ungreased axletree, and which is perpetually uttered; beside, the males are

pugnacious, and, though spurless, are capable of inflicting considerable injury on other poultry with their stout, hard beaks.

Like their wild progenitors, domestic Guinea-fowls prefer roosting in the open air to entering under the roof of a fowl-house; they generally choose the lower branches of some tree, or those of large thick bushes, and there congregate together in close array; before going to roost they utter frequent calls to each other, and when one mounts up the others follow in rotation; they retire early, before the common fowl or the pea-fowl. We have said that Guinea-fowls choose the lower branches of trees and bushes, and we speak from our own observation. Markwick, in his additions to White's *History of Selborne*, on the contrary says, "Guinea-fowls not only roost on high, but in hard weather resort, even in the day-time, to the very tops of the highest trees. Last winter, when the ground was covered with snow, I discovered all my Guinea-fowls, in the middle of the day, sitting on the highest boughs of some very tall elms, chattering and making a great clamour. I ordered them to be driven down, lest they should be frozen to death in so elevated a situation; but this was not effected without much difficulty, they being very unwilling to quit their lofty abode, notwithstanding one of them had its feet so much frozen, that we were obliged to kill it. I know not how to account for this, unless it was occasioned by their aversion to the snow on the ground, they being birds that came originally from a hot climate."

Though the Guinea-fowl seems a tolerably large bird, it is not so in reality; its loose, full plumage makes it appear larger than it is—it does not, when plucked, weigh more than a common fowl, if of fair size and in good condition. It is a beautiful bird, but too well known to require any detailed description. The male and the female very much resemble each other; the male, however, has the casque higher, and the wattles are of a bluish red; the wattles in the female are smaller, and red. The eggs are of a dusky white, minutely sprinkled with rusty brown.

FAMILY CRACIDÆ, OR THE CURASSOWS.

The Curassows (*cracidæ*), though belonging to the gallinaceous order, depart in some respects from the typical characters of the birds of this important section. The hind toe is not elevated on the shank or *tarsus*, but is rather long, and

touches the ground throughout its whole length; the head is fully feathered, generally crested, and there is often an extensive cere or naked skin at the base of the beak; sometimes the head is crowned with a horny casque or helmet; the bill is generally stout and vaulted; the trachea, in most species, forms loops or curvatures in front of the sternum before entering within the cavity of the chest. All the species (constituting several genera) are natives of Mexico and South America.

It may be deemed wrong in us to enumerate the curassows among our domestic poultry; and indeed our great object here is to draw attention to them as most valuable additions to our feathered stock. They are not only readily susceptible of domestication, but they have been domesticated, and on this ground we claim, for certain species at least, a place in the present work. These birds are of considerable size, and their flesh is exquisitely white and delicate.

Various species have been kept from time to time in the menagerie of the Zoological Society; and, it must be confessed, without the accomplishment of the chief object in view, namely, their naturalization; but it is not often that in a menagerie such an object is attained: sufficient attention cannot be given to them, there are too many objects to which care and time have to be devoted, to render it possible for keepers and their assistants to conduct experiments with such an end in view. Besides, the birds are kept in too strict confinement, and on cold flagged floors, often flooded with water, producing general ill-health, if not positive disease. We have seen curassows with their toes lost from the effects of cold and wet; it should be remembered that they are *arboreal* in their habits, and natives of the forest of a hot climate, and consequently should be accommodated as far as possible in a manner consistent with their habits and requirements. Mr. Bennett, in his work on the Gardens and Menagerie of the Zoological Society of London, published some years since, drew attention to these birds; and in 1837 one of the six medals offered as premiums by the Zoological Society was to the breeder of the greatest number of curassows for that year. No claimant, however, made good his title to the prize. It was a work respecting which many were anxious, but few able to give directions. "Of all the gallinaceous birds in the collection," says Mr. Bennett, "the most interesting are those which hold out to us a prospect of

supplying our farm-yards with new breeds of poultry of a superior kind. Such are especially the curassows. In many parts of South America these birds have long been reclaimed, and it is really surprising, considering the extreme familiarity of their manners, and the facility with which they appear to pass from a state of nature to the tameness of domestic fowls, that they have not yet been introduced into the poultry yards of Europe. That with proper treatment they would speedily become habituated to the climate, we have no reason to doubt; on the contrary, numerous examples show us that they thrive well even in its most northern parts, and M. Temminck informs us that they have once at least been thoroughly acclimated in Holland, where they were as prolific in their domesticated state as any of our common poultry. The establishment, however, in which it had been effected was broken up by the civil commotions which followed in the train of the French Revolution, and all the pains which had been bestowed on the birds were lost to the world by their sudden and complete dispersion. The task, which had at that time been in some measure accomplished, still remains to be performed; and it may not be too much to expect that the Zoological Society may be successful in effecting what was then begun, and in naturalizing the curassows as completely as our ancestors have done the equally exotic, and, in their wild state, much less familiar breeds of the turkey, the Guinea-fowl, and the peacock. Their introduction would certainly be most desirable, not merely on account of their size and beauty, but also for the whiteness and excellence of their flesh, which is said, by those who have eaten it, to surpass that of the Guinea-fowl or the pheasant in the delicacy of its flavour."

For ourselves, we think that private individuals, with moderate means at command, and bent upon the accomplishment of the desirable object of naturalizing these birds, would be far more successful than any institution or society, more especially in some of our southern counties, as Surrey, Sussex, Hampshire, and Kent. The birds should be kept in a large dry yard or netted inclosure, with a grass-plot and water in it; there should be two or three trees of moderate elevation, or, in lieu thereof, artificial trees made of branches, to which the birds should have free access; to this should be attached a good, high barn, perfectly weather-tight, with perches at some distance overhead: to this barn they

must be induced to resort every evening, which may be done by giving them their evening meal there, and then closing the door. There should be a window or two in the walls, well secured by netting, in order to give them sufficient light; boxes placed at the end of the perches, or in such situations as are in accordance with their instincts, should be provided for the hens to lay in, and be lined with straw and dried leaves. Should the hens exhibit no disposition to incubate, the eggs may be placed under a common fowl. The food and general treatment should assimilate to what is recommended in the case of the turkey. We give general directions only; the successful cultivator of these birds will have many things to learn from experience, but his knowledge of their habits in a state of nature will be a very safe and efficient guide to him. He must remember that the curassows are arboreal in their habits, far more so than either the pea-fowl, the turkey, or the Guinea-fowl; that most, though not all, make their large rude nests on the topmost branches of tall trees, and that the young, as we believe, are not in so forward a state, on their exit from the egg, as the young of the ground-breeding *gallinaceæ*.

It is not our object to describe every species of curassow, but to select from among them such only as are most likely to become readily naturalized; those, in fact, which for this purpose have been already introduced into the vivaria of England and the Continent, and in the management of which M. Ameshoff in Holland was so successful.

1. The Galeated Curassow (*Ourax pauxi*, Cuv.) In the genus *ourax* the bill is short, stout, compressed laterally, and vaulted above; the base of the upper mandible is dilated into a sort of helmet rising over the top of the head. This protuberance, however, is not visible in young birds till after the first moulting, when it appears as a small tubercle; it is much larger in the adult males than the females, and in the former attains the height of two inches; externally it is hard and bony, internally it is cellular and communicates with the back of the mouth. The nostrils (at least in this species) are placed behind the protuberance, in a membranous cere, covered with short velvety feathers; the head is covered with short and closely-set feathers; tarsi long; tail composed of fourteen stiff pens.

The galeated curassow equals a hen turkey in size; it is a native of the forests of Mexico, where it lives in large flocks, which frequent the branches of the tallest trees. It is said, how-

ever, to make its nest generally on the ground, a circumstance the more favourable for its naturalization as a domestic bird. The young are led about by the female, following her exactly in the same way as the chickens of the ordinary fowl, or of the pheasant or partridge, follow their respective mothers, obedient to her call. At first the young feed principally on insects and their larvæ, such as those of ants, &c., which are everywhere abundant; by degrees they begin to feed on various seeds and fruits, much in the same way as does the young of the turkey, which bird, in many of its general habits, this species appears to resemble.

The galeated curassow, with the exception of the abdominal region, under tail coverts, and extreme tip of the tail,

GALEATED CURASSOW.

which are white, is of a rich glossy black, with a tinge of green exhibiting itself in certain lights; the helmet is slate coloured, the tarsi are red, the claws yellow, the bill is bright red, the iris brown. The trachea or windpipe sweeps down for a considerable distance under the skin of the breast, making three loops or convolutions before it passes into the cavity of the chest. In an allied species (*ourax mitu*, Cuv.) the course of the trachea before it turns into the chest is very protracted (see Yarrell in *Proceeds. Zool. Soc.* 1830-1, part i.)

In captivity the galeated curassow is gentle and familiar, and we have no hesitation, from our own experience, in

asserting, that if once naturalized (and we regret that we are so situated as to render the attempt impracticable on our own part), this beautiful bird would be as tame and confiding as any pet fowls in a farm-yard; but we are sorry to say that we have never seen a chance given to it of displaying itself in its truly reclaimed condition. In this opinion relative to its docility we are confirmed by M. Temminck, who informs us that it was one of the species, not only the most easily domesticated, but which bred the most freely, in the menagerie of M. Ameshoff, before the lamentable disasters subsequent to the French Revolution—we mean that of 1793.

As we have intimated, other species belong to the genus *ourax*, but the species here described is the most common in our menageries, and therefore the most likely to attract the notice of a patriotic cultivator of our feathered dependants.

2. The Crested Curassow (*Crax alector*, Linn.)—In the genus *crax*, the bill is moderate in length, compressed, deep at

THE CRESTED CURASSOW.

the base, carinated above and curved towards the tip; it is encircled by a basal cere pierced by longitudinal nostrils, which are partially covered. Lore naked; head crested with curled feathers; tail ample and spread out, consisting of fourteen pens.

The crested curassow equals, or rather excels, the preceding species in size, and is a very graceful and noble bird; it is a native of Mexico, Guiana, and Brazil, and in fact appears to have an extensive range over the warmer regions

of the American continent. It abounds to such an extent in the woods of Guiana, that M. Sonnini regards it as one of the surest sources of supply on which a traveller penetrating the vast forests of that region, with his gun only, to which he must look for subsistence, may place his reliance. This bird congregates in numerous flocks, which are in general little disturbed by the intrusion of men into their haunts; indeed, so unsuspicious are they, that when their ranks have been thinned by the fowling piece or rifle, the rest have remained quietly perched upon the trees, as if unconscious of the havoc committed amongst them. In the neighbourhood of inhabited places, however, where their proximity to man, who is their most active persecutor, has taught them to fear him, they are far more wild, cautious, and distrustful, and recede deeper into the recesses of the wood on the approach of the hunter, who nevertheless destroys them in great numbers. They build large rude nests on the branches of trees, constructing them of twigs and sticks interlaced with stalks of herbaceous plants, and lining them with a bed of dried leaves and grass. Their period of incubation is said to be during the rainy season. According to Azara, the female lays eight eggs (Sonnini says five or six), nearly as large as those of a turkey, but white and thick shelled.

In captivity the crested curassow is gentle and familiar, and, according to M. Ameshoff's experience in his vivarium, may be domesticated with very little trouble. The galeated curassow is a fine bird, but we think this species to be altogether more graceful. Its beautiful forward-curled crest is an elegant ornament; it consists of velvety feathers, from two to three inches in length, and is capable of being raised or depressed at pleasure. The eyes are surrounded by a naked skin, which extends to the cere, and then assumes a bright yellow colour. The general plumage is of a deep black, with a slight metallic gloss of green, the abdominal region being of a dull white.

There are other species included in the genus *crax*, of which we shall mention only one, the red-knobbed curassow, (*Crax Yarrellii*), described from a species which died in the menagerie of the Zoological Society; in general character it agrees with *Crax globicera*, Linn. For an account of the structure of the trachea in this species we refer to the *Proceedings of the Zool. Soc.*, for February, 1831.

In passing over some species without definite notice we

may, perhaps, in the eyes of a few, commit an egregious error; but our object is not to give a monograph on the *cracidæ*, which would be a work in itself of some magnitude, but to indicate from among the numerous species those which, from our personal acquaintance with them in a living state, we can conscientiously recommend as most fitted for the experiment of domestication. Other species, we doubt not, are equal to the two we have already mentioned, but they are rarer, and, what is more, have never been subjected to any test. To theorise upon the origin of domestic animals, and to give plain directions consonant with our own experience, are two different things. Were we to attempt the naturalization of any curassows (and our will is good), we should select the two previously noticed,—not, however, to the exclusion of another, which, though not called a curassow, has little to distinguish it from birds bearing that name, and to which it is indeed immediately related. We shall therefore include it in our list.

3. The Guan (*Penelope cristata*, Gmelin.)—The generic characters of *Penelope* are thus detailed by systematic ornithologists:—Bill moderate, naked at the base, convex and high bent at the point; lore and base of the bill naked; under the throat a naked wattle-like skin, which is capable of being inflated or swollen; nostrils pierced in the cere, towards the middle of the bill half closed; tarsi long and slender; tail-feathers twelve.

The guans are of more rare occurrence in our menageries or vivaria than the curassows; we have, however, very frequently observed the present species—the crested guan—and can affirm that it is in all respects as fitted for naturalization as either of the preceding; indeed it has been domesticated in Holland, and therefore might be so in our country, though perhaps less profitably, as it appears that though these birds associate in flocks, they pair like the pigeon or the partridge. Perhaps their introduction as game might be the most advisable.

We are told by M. Temminck that the proprietor of a menagerie near Utrecht had bred the crested guan for several years; hence, as Mr. Bennett observes, "There can be little doubt that with proper care and attention these birds might be added to the stock of our domesticated fowls. They are spoken of as furnishing an excellent dish for the table. In a wild state they inhabit Guiana and Brazil, and perhaps extend

still farther to the north. Their food consists principally of seeds and fruits, which they search for upon the ground; but the greater part of their existence is passed upon the trees, on the tops of which they perch, and in which they build their nests. They are often found in large bands, but generally pair together with the strictest constancy. The females lay from two to five eggs. Their flight, like that of most gallinaceous birds, in consequence of the shortness of their wings, is low and heavy, and in the performance of this action they derive much assistance from their tail, the feathers of which may be expanded in the shape of a fan. All the birds of this genus appear to be known in Brazil by the name of *jacu*, pronounced *yacou*, derived, according to Marcgrave, from their note. This, as might be expected from the conformation of their trachea, is extremely loud, insomuch that, when a considerable number are collected near the same spot, the very woods, to use the expression of the scientific traveller (Marcgrave), re-echo with their clamorous cries." This species has been long domesticated in the poultry-yards of South America, and, as may be supposed, is subject to some slight variation in plumage.

The crested guan (*Penelope cristata*) may be thus described: —The upper parts generally are dusky black, or rather of a bronzed black glossed with green, changing in certain lights into metallic olive; from the under part of the bill proceeds a black stripe, which surrounds the ear; the bill is blackish, the cheeks are naked and of a violet purple; the feathers on the top of the head are long, forming a thick tuft or crest, which the bird can raise or depress at pleasure; the naked part of the throat is scarlet, with a contractile and extensive fold of depending skin, assuming the appearance of a large wattle; the fore-part of the neck and chest are spotted with whitish, each feather being bordered by this colour; lower part of the back, abdomen, and thighs, reddish or red-brown; the trachea is looped under the skin of the breast before proceeding to enter the thoracic cavity;—but for minute details on this anatomical point, we refer to Mr. Yarrell's paper in the *Proceedings of the Zool. Soc.* for 1833.

The female in this species of guan differs from the male in external characters, principally in having her plumage, that of the under parts more especially, tinged with red. Length about thirty inches, of which the tail feathers are thirteen. Size that of a large hen turkey.

CHAPTER VI.

THE COLUMBINE ORDER.

ORDER, *Columbæ*, Gray ; *Sponsores*, De Bla
Bonaparte ; *Gyratores*, Nobis.—From this o
it undoubtedly is, with doubtful alliances—
(we except the collared turtle-dove, *columb*
aviaries) is known as a domestic bird.
common pigeon and its many varieties, the

There is no part of the globe, setting asid
regions, destitute of birds of this order; b
most numerous in the warmer latitudes.
Zealand, the islands of the Indian Archipel
the Southern Ocean, present us with speci
beauty.

Pigeons pair, and it would appear that th
during life, which is not the case among th
Both male and female engage in the constr
and relieve each other in the task of incub
only are laid, and the young are hatched
helpless, and are sedulously fed and cheri
rents. Several pairs of young are reared
The young are fed for some days after exclu
not on pulse, or grain, or insects, but upon
secretion which is poured out from a series
crop both of the male and female, these
themselves into activity by a mysterious
juncture. This lacteous fluid is very abu
have often seen, will frequently drip fro
pigeons as they approach towards their you
into the open mouths of the nestlings by a
tion, the receiving one and the giver being
In the course of a few days, pulse or grain,
crops of the parents, and mixed with th
fluid, is given, the secretion gradually decr
and less required, till at length peas, moist
in the crop, are alone transferred into that

Previously to the time at which this lacteous secretion is needed, the crop of the pigeon is thin and membranous; but as the incubation approaches to a close, the membranes of the crop become thickened and very vascular, and the inner lining has a corrugated and glandular appearance. The lacteous secretion now begins to flow abundantly, precipitating a curd-like matter, which, mixed with the fluid, is transferred from the crop of the parent to that of the young. About the third day, some of the ordinary food, after maceration in the crop, is added, its proportion being increased, till at length, when the young quit the nest, it constitutes their food entirely.

So far, then, it would appear that the pigeons have peculiarities in which they differ most decidedly from the gallinaceous order on the one hand, and the passerine order on the other; and yet to both these orders have different naturalists assigned them, according to their respective theories. A few other points peculiar to the columbine order have yet to be noticed. None of the pigeons can be said to be true perching birds. Some, indeed, are decidedly terrestrial; but even those whose habits are arboreal may be said rather to rest upon the larger boughs than to adhere to their perch by a firm grasp. Their tarsi and toes resemble neither those of gallinaceous birds nor those of the passerine tribes generally. The tarsi are mostly short and thick, as are the toes also, which latter are furnished with blunt feeble claws. The tarsi are covered in front with broad imbricated scales. The hind toe, even in the most terrestrial species, is not placed high on the tarsus, as in the fowl, but on the same plane with the others, and in walking is fairly pressed to the ground. In this character the pigeons agree with the curassows. The form of the bill in the pigeons is peculiar. It is moderate in size, compressed laterally, more or less elevated and curved at the point, and covered at the base of the upper mandible with a soft swelling skin, in which the nostrils are pierced. The general plumage is full, closely arranged, but composed of soft feathers slightly adherent to the skin. The wings are long and pointed, the quill feathers firm, the pectoral muscles voluminous, and the powers of flight at a high ratio. However, there are exceptions. In the crowned pigeons of the Moluccas and New Guinea (gen. *lophyrus*) the wings are rounded and concave, and the powers of flight reduced. The tarsi, moreover, are covered with rounded scales.

The voice of the pigeon is a deep, hoarse, or guttural cooing, uttered principally by the male, as the language of endearment to his mate—

"Nec *genere* cĕriâ cessabit turtur ab ulmo."

While uttering this *gemitus*, the crop swells out, being inflated with air from the lungs, and the bird struts about, alternately raising and lowering his head.

Pigeons drink differently to most other birds. Gallinaceous birds sip, and raise up their heads; but pigeons take a long-continued draught, as Gilbert White says, like quadrupeds. So far we have sketched out generalities, nor shall we here attempt more. To enter into the details of families and genera would be foreign to our main purpose. We here merely desire to place the columbine order in its correct light, as we think, before an intelligent reader.

ROCK-DOVE.

We have already intimated that the rock-dove (*Columba livia*) is the origin of all our domestic pigeons. This is a British bird, but is most widely diffused, not only over Europe, but over Asia and Africa. Everywhere it haunts rocks, precipices, and caverns along the shore; towers, cathedrals, and high buildings. We have seen numbers about Canterbury Cathedral; and even in London wild blue pigeons make their

nests in the crevices and on the ledges of several of our public edifices, though perhaps these may be *feral*—that is, emancipated and returned to a state of nature—or partly intermixed with true wild birds. They must fly far abroad for food, and in winter, perhaps, trust to green vegetables and what they can pick up in the fallow fields, together with haws, the fruit of the dog-rose, and the seeds of wild plants. These birds swarm along the cliffs bordering the sea of Spain, Italy, France, and North Africa. Myriads tenant the recesses or caves of the rock of Gibraltar and the rock of Teneriffe. In India this species congregates in vast flocks, and is a constant inhabitant of every dilapidated building. In Britain, says Mr. Selby, it is found in various cliffs along the wide extent of our shores, as those of Caddy Island in South Wales. It is a never-failing resident in the wild precipices of the Orkneys, breeding in the caves, which are there numerous and of large dimensions, and where, according to Low, it retires to the inmost recesses, beyond the situations chosen for incubation by the auks, gulls, and other aquatic fowls. It also inhabits the caves in the cliff at St. Abb's Head, on the Berwickshire coast, in considerable numbers, as well as those in the Isle of Bass in the Frith of Forth.

1. The Common Turtle-Dove (*Turtur auritus*, Ray; *Columba turtur*, Linn.)—This elegant bird is a summer visitant to our island, arriving about the beginning of May and departing early in September. It is seldom to be met with in the northern or western counties, but is common in Essex, Kent, Surrey, Sussex, Middlesex, &c., where it breeds in the thickest woods, and may sometimes be seen in small flocks frequenting the pea-fields as soon as the crop begins to ripen. It is strictly monogamous, building a flat rude nest of twigs in the embowerment of dense foliage. The eggs are two, and of a white colour, about half as large as those of the common pigeon. This bird is spread over the whole of the southern and temperate parts of Europe. Its food consists of seeds, grain, berries, &c.

2. The Ring-Dove, Cushat, or Quest (*Columba palumbus*, Linn.)—The ring-dove, or *ramier* of the French, is a sedentary bird in the warmer and temperate portions of Europe, but migratory in colder latitudes. It is our largest British species of pigeon, and is a permanent resident. It frequents woods and large groves, breeding early in the spring, and producing about three broods in the course of the season. It builds a

flat nest of sticks and twigs in the fork of a branch, and often in fir trees or amidst masses of clustering ivy. After the breeding season, these birds assemble in flocks, and visit fields of peas or beans, and stubble fields; acorns and beach-mast are also in great request. As the winter advances, berries and green vegetables, such as turnip tops, &c., constitute their food.

3. The Stock-Dove (*Columba œnas*).—The stock-dove (*La columbin, ou petit ramier* of the French) has been erroneously regarded as the *stock* whence has descended our common pigeons; but this is an error. The stock-dove is arboreal in its habits, and is principally confined to our midland counties, where it is a permanent resident, breeding in woods, its rude nest being often placed on the top or in the hollow of some aged pollard tree. In its habits it precisely agrees with the ring-dove, and it feeds on the same food. As this bird and the *Columba livia* have been confounded, and as this bird has been supposed to be the origin of our domestic race, we give the following description of it from Selby:—Head and throat deep bluish gray; sides of the neck glossed with different shades of green and purple; the *feathers shorter, more distinct, and stiffer than those of the rock-dove;* lower parts of the neck and breast pale lavender purple; belly, thighs, and under tail coverts bluish gray, with a slight purplish tinge; back deep bluish gray; wing coverts paler, and some of the greater ones spotted and barred with black; but *not forming any defined bar* as in *Columba livia;* quills blackish gray, the outer webs near the base of the feathers passing into bluish gray; lower part of the back bluish gray; tail of the same colour, with a broad black bar at the end, and having the outermost feather margined with white; wings, when closed, reaching to *about half the length of the tail; irides brownish red;* legs and toes bright *cochineal red.*

4. The Rock-Dove (*Columba livia*).—This non-arboreal rock and tower-haunting bird (*Le bisset* of the French) approaches in plumage to the foregoing species, from which, however, it is most decidedly distinct. The following characters will serve to mark it:—Bill blackish brown; *irides pale reddish orange;* greater coverts and secondaries *barred with black, and forming two broad and distinct bands across the closed wings;* lower part of the back *white;* wings, when closed, reaching to *within half an inch of the end of the tail; legs pale purplish red.* In size the two species nearly agree, but the rock-dove is

more slender. It is, then, from this bird that our domestic pigeon claims descent; and although Gilbert White entertained some indefinite ideas respecting the stock-dove, the mode of nidification of which he was unacquainted with, he clearly discriminated between the species, and in a letter to Pennant (XCIV.) thus expresses himself:—"I readily concur with you in supposing that house-doves are derived from the small blue rock-pigeon, for many reasons. In the first place, the wild stock-dove is manifestly larger than the common house-dove, against the usual rule of domestication, which generally enlarges the breed. Again, those two remarkable black spots on the remiges of each wing of the stock-dove, which are so characteristic of the species, would not, one should think, be totally lost by its being reclaimed, but would often break out among its descendants. But, what is worth a hundred arguments is the instance you give in Sir Roger Mostyn's house-doves in Caernarvonshire, which, though tempted by plenty of food and gentle treatment, can never be prevailed on to inhabit their cot for any time, but, as soon as they begin to breed, betake themselves to the fastnesses of Orm's-head, and deposit their young in safety, amidst the inaccessible caverns and precipices of that stupendous promontory."

The rock-dove feeds on grain and seeds of various kinds, as well as on vegetables. According to Montagu, it also devours some kinds of snail, and is especially fond of the *helix virgata;* but this we cannot assert from our own knowledge. It breeds about three times in the season.

It is evident that from a very remote period the pigeon has been domesticated in the East, and thence, we suspect, has gradually spread over Europe, at least as far as some of its varieties are concerned, such as the carrier, the barb, and others. To reclaim the pigeon up to a certain point is by no means difficult; in fact, dove-house pigeons, kept in large flocks for the supply of the markets with the young during the season, are rather *familiarized* than *reclaimed*—they retain much of their wild nature, and, generally speaking, so closely resemble the rock-dove in appearance, as to render it difficult to distinguish between them; they are usually of a leaden blue, barred on the wings, and white on the lower part of the

back. Such also is the character of the pigeons kept in the dove-towers of Persia; amidst the vast flocks of which a white pigeon is so rarely to be seen as to be regarded as a sort of prodigy.

Though fancy pigeons are kept for the sake of their beauty and peculiarities, the ordinary dove-house pigeon is reared almost exclusively for the sake of its flesh, which is accounted in most countries a delicacy. But how far the rearing of great numbers of these birds is profitable in our country may admit of question; the quantity of gray peas, beans, and grain, which even a small flock will annually consume, is enormous. What, then, must be the consumption of flocks of many hundreds? We cannot give any certain statistical details, but, turning to M'Culloch's *Account of the British Empire*, we find (vol. i., p. 500) the following observations:—"*Pigeons.*—There are great numbers of these birds in England. A dove-cot is reckoned an indispensable adjunct to a country gentleman's residence, and in many countries it is customary for farmers to keep a few pairs. They are occasionally reared in the view of supplying the market, but for the most part they are kept as articles of luxury. They are very voracious, and destroy great quantities of grain. There are some rather curious speculations on this subject in Vancouver's *Survey of Devon*. He supposes that there are in all 20,000 pigeon-houses and 1,125,000 pairs of dove-house pigeons in England and Wales, and that they consume 157,500,000 pints, or 4,921,875 Winchester bushels of grain a-year!. Of course there must be a good deal of looseness in this statement; it has been said by some to be much under, and by others to be much over the mark. But, without giving any opinion on this point, there can at all events be no question that the number of pigeons is very great, and that the destruction they carry on, when considered in the aggregate, must be very considerable indeed."

Young pigeons sell in the market for about a shilling per couple—the breeder, of course, sells them for much less; each pair will rear four pairs of young in the season. Will the price obtained for these four pairs remunerate the breeder for the keep of a pair of adult birds throughout the year? We much doubt it; however, we will not be positive, for in some districts these birds may be kept at far less expense than in others. In the markets in France pigeons are abundant and very fine, and in some parts of that country we have

seen them in enormous flocks scattered over the fields gleaning for themselves; but in spring, and again throughout the winter, they must require more food than they can collect by ranging the country. It is principally from France that the London markets derive their supply.

All must have noticed the *gyratorial* or wheeling flight of our domestic pigeons. We here allude to this the more expressly, as on this peculiarity depends, in our opinion, the facility with which these birds, taken to a long distance from their homes, find their way back when released from their confinement. Remarkable notices of pigeon-flights occur from time to time in the public papers, and wagers are often made upon the return of pigeons to a certain spot within a given space of time. If the distance be within twenty or even thirty miles, no previous training or especial practice is needed; but not so where the distance is very great. This flight cannot be compared to that of migration; the pigeon is influenced by pure *nostalgia:* it seeks its "old accustomed home" with intense desire, and in this effort it is aided by its mode of flight. The *rationale* of the pigeon's return home from a distance we take to be as follows:—Pigeons fly in wide circles at a considerable elevation; they note every tower or steeple, every wood, every river,—in fact, every land-mark within the range of their acute vision. Consequently, if taken to some distance beyond those well-known marks, let them only once, in the wide circles they make, get sight of them, or of one of them, they know how to steer their course,—they hasten to the way-mark, and thence, towering aloft, descry their home. It is by sight that the pigeon makes these journeys, and it extends its aërial circles in proportion to its distance from the known way-marks; should these be obscured by a fog or clouds, the bird wanders at random, and perhaps never finds its way back. In order to perform long journeys, as from some town in France, Belgium, or Holland, to Dover or London, the birds require training; they are taken at intervals to places farther and farther remote from their home, and thus they become acquainted, from their elevation in the air, with a terrestrial expanse beneath them of vast extent. One or two well trained birds will serve as guide to a less practised flock, and lead them to their destination. We occasionally read in the public papers of several pigeons being let loose in Antwerp, or St. Omer, or some other town, destined to return to London within a given time, for a wager, and the

details as to the time of the arrival of the several birds are recorded. There is less mystery in all this than may at first appear. The keenness of the pigeon's vision, its rapidity of flight, its enduring strength of wing, and its acquaintance with the way-marks beneath it, are sufficient to account for the performance of the exploit. When first turned off, the birds gyrate to a great altitude; let one known way-mark be seen, it is sufficient—the direction is clear; other way-marks present themselves in succession, till at length the aërial traveller discerns its longed-for home.

We may now proceed to a brief notice of the principal varieties of our domestic pigeon, premising that, from time to time, under the culture of experienced fanciers, others may originate with which we have no personal acquaintance. As we have just discussed the principles which to our mind clear up the difficulties relative to the return of a pigeon from great distances to its home, we shall commence with that variety, of oriental origin, which from time immemorial has been employed as a messenger, carrying communications of importance or letters of confidence.

1. The Carrier or Horseman.—Fanciers of the present day, in the neighbourhood of London, apply the term *carrier* and *horseman* to a very remarkable breed of pigeons, which is sedulously cultivated. Whether, originally, any distinguishing character separated the carrier and the horseman we cannot ascertain; if such was the case they exist no longer, and the terms have become synonymous.

The carrier is a splendid bird, remarkable for the elegance of its contour; it is of large size, and, if kept in training, of extraordinary powers of wing. The shoulders, when the wings are closed, are broad and strongly knit, the breast is full and muscular, the wings long and acute, with very rigid quill-feathers, and indeed the general plumage is close and compact; the neck is long and slender, the head narrow, and flat on the crown, and the eye animated. The colour of the iris varies; in some it is of a fiery red, in others of a pinky pearl tint. The eye is surrounded by a rosette or rose-like circle of carunculated fungous skin of a white colour, which in adult birds is very conspicuous, and often rises above the level of the top of the head; this rosette should be well and regularly formed, with the eyelids fairly opened and in the centre. In good birds it equals a shilling in diameter. The beak is long, measuring by the gape, from an inch and a

quarter to an inch and a half—it should be strong and straight; at the base of the upper mandible the soft pulpy skin is developed into a large white fungous excrescence, which advances boldly on the forehead, and spreads broadly across the beak; this protuberance should overtop the narrow flat skull, at least in adult birds, for in the young of the year both this protuberance and the rosette are comparatively small, and always smaller in the female than in the male.

The carrier is elongated in general shape, and carries itself gracefully. It varies in colour; we have seen black, blue, dun, white, and blue and white breeds; duns are in great

THE CARRIER PIGEON.

estimation, and three or four pounds is not an uncommon price for a pair of perfect young birds.

Though this variety is called the "*carrier*" *par excellence*, from its powers of wing and rapidity of flight, still any of the common breeds enjoying the faculty of swift flight may be, and are, used as carriers. Pigeons are still principally used in our country as messengers from the race-course, the prize-ring, or the walking-ground. But the electric telegraph has in a great measure superseded them. It is little more than five years ago, that one of the annual expenses of a London daily newspaper was £1800 for pigeon expresses.

2. The Dragon, or Dragoon.—This variety results from a

cross between the preceding and some of the ordinary breeds. In general appearance it approximates to the carrier, but is inferior in size, less robustly formed about the shoulders, and with the caruncles or *wattles* and the *rosette* more circumscribed. Like the horseman, this variety has been employed in carrying written messages, and indeed is far more generally used by those who attend races, &c., than the former, which is too valuable for its owner to run the risk of losing. The flight of the dragon is very impetuous, and hence perhaps its name. We have known dragons imposed by dealers, as horsemen or carriers, upon those who were not versed in fancy lore.

8. The Barb.—This pigeon, formerly very much admired by fanciers, and still not without its advocates, appears, if we may rely on its name, to have originated in some part of Northern Africa. It is a bird of delicate temperament, and not adapted for long or rapid flight. It is fitted exclusively for the pigeon aviary; indeed, we do not remember to have ever seen it at large. Its plumage is mostly black, sometimes (but rarely) dun; the beak is short and stout, with a small carunculated wattle at the base; a broad, naked circle or rosette of scarlet spongy skin surrounds the eye; the back of the head is mottled, ornamented by a short crest of curled or upturned feathers. The barb is not a common variety, and is, perhaps, scarcer than it was some years since.

4. The Pouter.—All pigeons, as is well known, have the capability of inflating their crop with air; and a fine pigeon, with breast feathers glossed with metallic tints, strutting and bowing with inflated crop around his mate, presents no uninteresting spectacle; but this remark will not apply to the pouter, and we wonder that this variety should have received so much attention from fanciers. There is nothing pleasing in its appearance or graceful in its proportions; indeed, the inflation of the voluminous crop, rendering an erect, stiff, and apparently constrained attitude necessary, gives an aspect of distortion, or of a want of due balance of parts. The pouter is of large size, often measuring eighteen inches in length from the tip of the beak to the end of the tail. The chest is not really voluminous, though it appears enormous when the crop is distended with air; the back is concave, and the tail ample; the tarsi are very long, and covered with downy feathers. These pigeons are of various colours, as blue, rufous, pied, or altogether white. Those birds which

are tall, erect, with a very ample crop, and with the colours of the plumage regularly disposed, and, according to certain fancy rules, are esteemed the most valuable. The pouter is formed by a cross between the *dragon* and the *old Dutch cropper*, which latter bird, except in the development of the crop (whence its name), had nothing to recommend it. From this intermixture, not without much care and expense, has resulted this favourite variety. The flight of the pouter is buoyant, but not rapid, nor capable of being long sustained. As varieties of the pouter, or rather as breeds allied to it, may be mentioned the *uploper* and the *Parisian pouter*, said to be a beautifully marked bird; but with these we have no personal acquaintance.

5. The FAN-TAIL, or BROAD-TAILED SHAKER.—This is a very singular variety, by many much admired. It is a small pigeon, with a preternatural development of the caudal feathers, both as to number and size. These feathers amount usually to about sixteen, but in extraordinary birds even to twenty-six (the normal number in the pigeon being twelve). These feathers, moreover, are elevated, and form two parallel planes, not unlike those of the common hen, but larger in proportion. The neck is long, and singularly slender, and is surmounted by a small head with a short beak. This bird has the habit of throwing back the head till it almost, if not quite, touches the tail feathers; the chest is thrown forwards, the wings droop, and the neck vibrates with a strong quivering motion. The best *fan-tails*, we believe, are of a pure white; pied birds are in less estimation. As might be presumed, the powers of flight in this variety are very limited. It is exclusively a fancy bird. Some persons discriminate a variety which they call the *narrow-tailed shaker;* but this is only a degenerate breed of the fantail, or the result of a cross.

6. The JACOBINE, or CAPPER.—This is an elegant little sort of fancy pigeon, in considerable esteem Its principal characteristic consists in the elongation and silky loose texture of the feathers of the back and sides of the neck, which are brought forward in such a manner as to form a sort of hood over the head, and extend in a double frill down the chest, producing a very pleasing appearance. The head is small, with a short beak, and a pear coloured iris. The jacobine varies in colour. Those of a fawn yellow are generally preferred. Flight indifferent.

We may here notice two varieties called the *capuchin* and the *ruff*. These, in general characters, approximate to the jacobine, but have less luxuriance of the plumage of the neck and chest.

7. The TURBIT.—The upper part of the chest of this pretty little fancy pigeon is ornamented with a tuft of feathers, which opens both ways and laterally with a curl. The head is small, and the beak short; in colour, this bird is subject to variety, but generally has the quills, tail, and under parts white.

A variety closely resembling the *turbit* is called the *owl*, from the form of its beak, which is short, thick, and hooked. It has a pectoral frill of curled feathers.

8. The NUN.—Many persons greatly admire this elegant pigeon, which is indeed amongst the prettiest of our varieties. The head, quills, and tail are black, (sometimes fawn yellow, rarely blue,) while the rest of the plumage is snowy white. On the top of the black head is a tuft of soft loose white feathers, which, forming a snowy hood, in conjunction perhaps with the contrast of black and white, has led to the name by which this variety is known.

There is a variety of *nun*, termed the *helmet*, from the disposition of the feathers which form the crest; instead of resembling a full hood, the crest rises in something of the shape of a helmet.

9. The TRUMPETER.—It is from the peculiar loudness and harshness of its cooing notes that this variety has received its name. Its colour varies, but the tarsi are feathered to the toes, the back of the head is crested, and a tuft springs from the base of the beak over the forehead. We do not remember to have seen any genuine fancy birds of this variety; but the truth is, that among *all fancy pigeons* changes are gradually taking place; varieties once highly prized, and selling for large sums, with ready purchasers, are now neglected and passing away; we think, moreover, that pigeon fancying is altogether on the decline; and if our suspicions be correct, the causes are too obvious to require much seeking for. This change may be perhaps in itself of no moment, but trifles in human society are often the indicia of circumstances or affairs of importance. Pigeon fancying is one of the innocent amusements of persons of the middle classes, and of those of superior grade in the so-called lower; it is a natural amusement, and also interesting, but it is not unattended by some degree of expense.

10. The TUMBLER.—This variety of pigeon needs not any description; it is everywhere common, and is kept in abundance in simple aviaries on many of the house-tops, even in the denser parts of the metropolis; flocks of them, especially in clear mornings, are turned out in order to exercise themselves for an hour or two, in their circling flight and aërial gambols. There are several varieties of these birds, as *bald-heads*, which have the head white, and *bearded tumblers*, either blue or black, with a white moustache or stripe extending from the base of the lower mandible along the sides of the throat.

The flight of a flock of *tumblers* is very interesting; the birds keep in compact array as they wheel around, every now and then making backward somersets, turning completely round in the air, which for a moment checks their flight, when, recovering their wings they again pursue their course. On descending from their elevation and preparing to alight, these somersets are repeated in frequent succession before they gain their feet; but whether from mere playfulness, or because they cannot help it, we could never satisfactorily determine. The bird is light, vigorous, and capable of long continuance in the air without the slightest fatigue. In the tumbler the figure is compact, the chest broad, the neck rather slender, the head small and round, the beak short and spine-shaped, the iris of a clear pear colour.

11. The ALMOND TUMBLER.—In size this once prized fancy bird is very small, and delicately framed. It is derived by the breeder's art from the stock of the common tumbler, but is not a bird of much power of flight, being rather fitted for the aviary than for the ordinary pigeon-house; its head is round and small, its beak very short and spine-shaped; its iris pear-colour. The tints of its plumage are beautiful but varied—yellow, black, white, brown, and gray, more or less of these colours being intermingled and blended so as to produce a very pleasing effect. Formerly, birds of this kind, perfect as to the required distribution of colour, sold for considerable sums; but they are now, we believe, less valuable. Sir John Sebright's breed of Almond Tumblers was some years since perhaps the first in England.

To the varieties already enumerated, we might add several others, as the *spot*, the *lace*, the *finikin*, and the *Friezland runt*, with reversed feathers; but these breeds are not common, nor are they held of much account. As for such birds

as the *French runt*, the *Leghorn runt*, the *Spanish runt*, &c., they are not to be placed among the fancy varieties, being remarkable merely for size; they are dove-house pigeons.

Domestic pigeons are fed on horse beans, gray peas, barley, and other grain; they require plenty of fresh water, and love to bathe—cleanliness is imperative; their breeding-boxes should be frequently cleaned out and lime-whited, as should also the aviary in which they are kept, and its floor swept and sanded. Pigeons are extremely partial to salt and old mortar, and will pick the latter from between the earthen tiles forming the roofs of houses. Many fanciers make a composition of salt, mortar, a little clay, and spicy seeds, as caraway, placed so as to be accessible to the birds; and compositions of a similar nature are used by some in a dishonest way, as an allurement to entice stray birds, or those of their neighbours, to enter into their traps.

CHAPTER VII.

DUCKS AND GEESE.

To enter into a general outline of the characters of the order *natatores*, as it at present stands, is here out of the question. To the so-called family *anatidæ*, or duck-tribe, our attention must be solely directed. Throwing aside the subdivisions of this family, based on fluctuating theories, proposed by various ornithologists, we may state that it embraces the ducks, the swans, the geese, and the mergansers.

To this section belongs certain qualities in common. The species are all more or less aquatic in their habits, are long-necked, and have a boat-shaped body, covered with large, well-compacted and nicely-arranged waterproof feathers, concealing an under-vest of fine close down. The wings are moderate and acute, with rigid quill feathers; it is not, however, until the birds mount to a great elevation that their flight becomes easy, but this altitude attained, they are strong on their pinions. They fly in order, with a leader, changed from time to time; sometimes the aërial troop is marshalled in Indian file; this is suddenly exchanged for two lines *en triangle*—that is, forming the two lines of a triangle without the base line—the leader being at the apex; sometimes they form solid masses of serried columns, but, except when suddenly aroused by the gunner from their slumbers on the water, they generally assume a definite figure in flight, and especially during their long migratory journeys, uttering, as they fly far above head, their wild sonorous cry. Occasionally single birds as pioneers advance before the troops, or others as rear-guards follow the squadron.

On the ground, the *anatidæ* are awkward and waddling; their legs are short and placed considerably backward, so that the fore part of the body preponderates, and the webbed or oar-formed toes are destitute of elasticity. Some species, however, are much more fitted for terrestrial habits than others, as the Cereopsis goose of Australia, a bird which might be easily naturalized, and is valuable for the sake of its

flesh. Some are semi-arboreal, roosting on the branches of trees, and rearing their young in nests built either in the holes of trees, or on the forks of the larger branches. As an example, we may allude to the beautiful summer duck of America (*Dendronessa sponsa*). This bird rears her young in the holes of trees, generally overhanging the water. When strong enough, the young "scramble to the mouth of the hole, launch into the air with their little wings and feet spread

THE SUMMER DUCK.

out, and drop into their favourite element; but whenever their birthplace is at some distance from it, the mother carries them to it, one by one, in her bill, holding them so as not to injure their yet tender frame. On several occasions, however, when the hole was thirty, forty, or more yards from a *bayou* or other piece of water, I observed that the mother suffered the young to fall on the grasses and dried leaves beneath the tree, and afterwards led them directly to the nearest edge of the next pool or creek."—*Audubon.*

In the *anatidæ* the bill is large, more or less depressed, broad, and covered with a sensitive coriaceous membrane; the upper mandible is furnished at the tip with a hard nail or *dertrum;* the edges of each mandible internally are laminated, or furnished with close-set transverse lamellæ, which are more developed in some species than others. In the shoveller duck, for example, this lamination is highly developed, and presents the appearance in both mandibles of a fine pectinated or comb-like appendage, accompanied with great

dilatation and depression of the front part of the bill, which is spatulate in form and outline. This pectination acts as a strainer, while the bill, freely supplied by branches of the fifth pair of nerves, is engaged in probing and testing the mud in search of food. Thus the beak is at once a feeler, a strainer, and an organ of prehension. In accordance with the structure and sensibility of the beak, is the tongue modified. It is also a sensitive organ, and, instead of being slender and horny, is large and fleshy, and furnished on its edges and other parts with fimbriations or appendages. The tongue co-operates with the mandibles in the discrimination and appropriation of food. The peculiar action of the mandibles of the duck while probing the mud for food cannot have escaped observation. Yet the ducks exhibit different modes of feeding, to say nothing of different partialities according to the species. Mr. Skelton, the intelligent keeper of a decoy in Lincolnshire, supplied Dr. Richardson with the following information:—"The mallard, pintail, and teal frequent rich flooded lands, *swittering with their nebs in the soil*, and sucking out its strength; but the widgeon feeds quite differently, being an *amazing fowl to graze, a strange eater of grass*." "It is especially fond of flutter-grass (*glyceria aquatica vel fluitans*), which it crops on the surface of the water, but it likewise eats many other herbs. When the decoy has been so full of widgeons that they have devoured every blade on the landings, Skelton has taken advantage of their absence in the night, when they resort to the green salt-marshes on the sea-coast, and laid down sods pared from the fields, on which they readily graze. In common, however, with the mallard, teal, and pintail, they are fond of willow-weed seeds (*epilobium*), with which he feeds all the fowl in his decoy, as they prefer it to oats and every other kind of grain." In the *Fauna Boreali-Americana*, Mr. Waterton states, that the widgeon feeds by day, eating grass like a goose, while its congener, the mallard or wild duck, invariably refuses this food, and seeks for its sustenance by night.

In all the *anatidæ* the gizzard is peculiarly strong and muscular, but amazingly so in the tribe or section of *diving ducks*, such as the eider, the golden-eye, and others, which feed chiefly on shell-fish, which they obtain by diving into the sea or about the mouths of rivers. The shells are ground and crushed to fragments by the action of the powerful gizzard. None of the *diving ducks* are domesticated.

We may here observe that the ribs in the *anatidæ* in general, but especially in the diving ducks and such as are most aquatic, are carried out to a great extent posteriorly, so as to protect the abdominal viscera from the pressure of the water during the submersion of the body.

Most of the birds of this family present something peculiar in the construction of the trachea. In some species the trachea is singularly convoluted, as in many of the swans; in others there is at the lower part of the trachea, just within the chest (in the male), an osseous drum or *bulla*, which influences the tones of the voice.

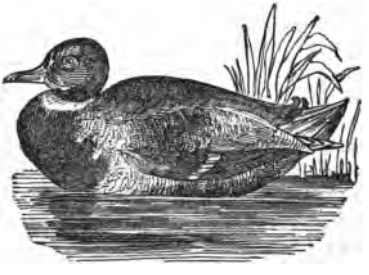
The family *anatidæ* is resolvable into the following sections:—1. The True Ducks (*Anatinæ*), with the hind toe non-lobated; 2. The Diving Ducks (*Fuligulinæ*), with the hind toe lobated; 3. The Swans (*Cygninæ*); 4. The Geese (*Anserinæ*); 5. The Mergansers, (*Merganinæ*), birds essentially aquatic, with oar-like toes, and legs compressed and placed as far backwards as possible.

The Common Duck (*Anas boschas*, Linn).—It is from the common wild duck or mallard (*Le Canard Sauvage* of Buffon) that the domestic duck is derived, although we know nothing of the circumstances how, or the time when, the domestication of our tame race was effected. One thing, however, is very certain—the wild breed and the tame will freely intermix, and the progeny partake rather more decidedly of the habits and manners of the former than of the latter.

There are indeed many points, irrespective of colour (which is, of course, variable in our domestic breeds), in which the tame and the wild duck differ. The tame duck is polygamous, but the wild duck mates; and here a slight sketch of the habits and manners of this species may be advisable

The wild duck is very widely distributed throughout the temperate and colder latitudes both of the old and new world. Generally speaking, it is migratory in its habits, the vast flocks which visit the south in winter retiring on the approach of spring to their high northern breeding places. In our island the species is indigenous; and although drainage and the cultivation of bog-lands have rendered it far more scarce than formerly, still it is to be found wherever suitable retreats afford it a convenient asylum. Few sheets of water in parks are destitute of their home-bred wild-ducks, and it still tenants the borders of our lakes and rivers in secluded localities. So abundant was the wild duck formerly in our fenny dis-

tricts, that, according to the authority of Pennant, at a single driving in the fens of Lincolnshire, before the young had taken wing, and when the old birds were in the moult, one hundred and fifty dozens have been taken. Mr. Selby observes that, in the same district at the present day, there are not reared more than a dozen broods annually. Scanty, however, as our native flocks may be, their numbers are augmented by winter arrivals from the north, and of these thousands are taken in decoys, or fall before the withering fire of the wild-fowl-shooter. Innumerable multitudes visit Holland, Belgium, and the marshy districts of France, whence, during the latter part of autumn and through the winter, thousands are sent to the London markets.



WILD DUCK OR MALLARD.

Domestication has modified the habits of the tame duck. In a wild state, for example, the duck pairs with a single mate; the pairing time is about the end of February or early in March, and the two continue associated together until the female begins to sit. At this juncture the male deserts her, and joins others of his own sex similarly circumstanced, forming small flocks, which may be seen, at the latter part of May and in June, without a female amongst them. At this time, moreover, the male begins to lose his rich attire, assuming in a great measure the colours of the female, which he retains until the general or autumnal moult gives him new livery. The tame duck is polygamous, nor does the drake undergo so decided a change of plumage; his colours may become duller till the autumnal moult renews their beauty, but this is all.

The wild duck makes a nest of withered herbage in some dry and secluded spot amidst the marshes, under the covert of a bush, a thick tuft of rushes, or intertangled vegetation, and lays from ten to fourteen bluish white eggs. Strange spots, however, are sometimes chosen as the site of the nest. Many instances are on record of the nest being built on the fork of a large tree; we have known it situated on the top of an old willow pollard, and Mr. Selby knew an instance in which, near his own residence, a wild duck laid her eggs in the deserted nest of a crow, at least thirty feet from the ground. In these instances, as Mr. Selby suggests, the young are carried to the ground in the bill of the parent,—a mode of conveyance, he says, "known to be frequently adopted by the eider duck." Like the lapwing and the partridge, and many other birds, the wild duck has recourse to artifice in order to draw an intruder from her nest, or from her brood of young concealed in some brake or jungle of rushes. She pretends lameness, flies with apparent difficulty a few feet before the intruder, as if unable to escape if he vigorously pursue, and thus she leads him about until he is far from her nest, when up she springs, to his utter astonishment. This care is even bestowed on the eggs; the wild duck never leaves her nest without covering it with down and dried grass, so as to screen them most effectually from the sight of crows, ravens, and other marauders. The drake or mallard has a large osseous *bulla* or drum, at the lower extremity of the trachea, which is equal in its diameter throughout. The plumage of the wild duck, male and female, is too well known to need description.

From the wild duck, let us turn to its domesticated descendant. It is not in all situations that ducks can be kept with advantage; they require water much more even than the goose; they are no graziers, yet they are hearty feeders, and excellent "snappers up of unconsidered trifles:" nothing comes amiss to them—green vegetables, especially when boiled, the rejectamenta of the kitchen, meal of all sorts made into a paste, grains, bread, oatcake, animal substances, worms, slugs, and crushed snails, insects and their larvæ, are all accepted with eagerness. Their appetite is not fastidious; in fact, to parody the line of a song, "they eat all that is luscious, eat all that they can," and seem to be determined to reward their owner by keeping themselves in first-rate condition, if the chance of so doing is afforded them. They

never need cramming—give them enough, and they will cram themselves; yet they have their requirements, and ways of their own, which must be conceded. Confinement will not do for them; a paddock, an orchard, a green lane, and a pond; a farm yard, with barns, and water; a common, such as Barnes Common, smooth and level, with a sheet of water, and nice ditches, abounding in the season with tadpoles and the larvæ of aquatic insects,—these are the localities in which the duck delights, and in such they are kept at little expense. They traverse the green sward in Indian-file (an instinctive habit still retained), and thus return at evening to their dormitory, or emerge from it to the edge of the pond or sheet of water, over which they scatter themselves; thus also they come to the call of their feeder. Ducks should always have a lodging-place of their own; they should be separate from fowls, and never housed beneath their perches; yet, where fowls are kept, a little contrivance will suffice to make their berth, even in a fowl-house, tolerably comfortable. In winter, a thin bedding of straw, rushes, or fern-leaves should be placed on the floor of their dormitory, and changed frequently. More than four or five females should not be allowed to a single drake; the wild duck, as we have said, is monogamous, and this should not be forgotten. The duck lays on the average from twelve to twenty eggs in the season; there are, however, instances in which a duck has laid as many as eighty-five eggs; but these cases are rare. The female will cover with comfort twelve or fourteen, and in most cases is a steady sitter. It is, however, very common to put ducks' eggs under hens, and it is ludicrous, though somewhat painful, to see the trepidation and anxiety of the foster-mother on the edge of a pond, into which the young ducks have plunged, regardless of her feelings and incessant clucking, a language they do not understand. At what age young wild ducks are introduced by their parents into the water we cannot say; but this is certain, that if young tame ducks visit the water too early, they are apt to become cramped, and then perish; indeed, while visiting Mr. Cantelo's hatching establishment, at that time near Turnham Green, we were assured that if young ducklings become once saturated with water, they invariably perish, and are in this respect as tender as young turkeys. Ducks, although they float on the water, never become wet (that is, when properly fledged), for their plumage throws off the fluid, and they return as dry (legs excepted)

from the pond as they were before they entered it. Young ducks are easily reared, being fed on meal mixed with potatoes and green meat boiled; they are useful in gardens, which they clear of slugs and snails, without injuring the crops of vegetables. As a caution we would here observe, that the ponds to which they are allowed access should contain neither pike nor eels; and rats should be extirpated from the same places. Rats and weasels often thin flocks of ducklings, to the loss and vexation of their owner.

The domestic duck varies greatly in size and colouring; the white Aylesbury breed is much in request; this indeed is the breed which prevails over Buckinghamshire generally, where many families derive a considerable portion of their subsistence by rearing these birds for the market. Those hatched in the early part of the season may be said to be brought up by hand. The interior of the cottages of those persons who follow this occupation presents a curious appearance to the stranger, "being furnished with boxes, pens, &c., arranged round the walls for the protection of the tender charge of the good-wife, whose time and attention are taken up with this branch of domestic economy."—(Mowbray.) The Rhone duck, a large dark-coloured variety, is also highly esteemed, and a cross breed between this and the Aylesbury is said to be superior in flavour to all others. Ducks are abundant in France, and very fine, especially, as we have seen, in Normandy, Picardy, Brittany, and Languedoc. The duck-liver pies of Toulouse, in the province last named, are almost as celebrated as the goose-liver pies of Strasburg. The practice of nailing these birds to a board, placing them before a fire, supplying them with food and water, and keeping them in this horrible situation until the liver becomes morbidly swollen, is of great antiquity; it appears to have been practised by the Romans, but nothing can excuse such detestable barbarity. Let the epicure who luxuriates upon *pâté de fois gras*, ask himself it he would like to initiate his children in such a mode of treatment to defenceless animals; if he can answer "Yes!" he will relish his *pâté*.

Among the curious but useless and unpleasing varieties of the domestic duck which we have seen, may be mentioned the hook-billed duck (*Anas adunca var.*, Lin.; *Anas rostro incurvo*, Brisson), remarkable for the preternatural distortion of its beak; and also the penguin duck, which walks, or rather waddles, in an upright position like the penguin, owing to the

unnatural position of its legs. Such varieties are of no value; they are the result of accidental malformation transmitted from generation to generation.

The Musk Duck, erroneously called the Muscovy duck (*Carina moschata*, Fleming).

THE MUSK DUCK.

The musk duck, so termed from the strong scent of musk which its skin exhales, is undoubtedly the type of a genus very distinct from that of the common duck. In this species the feathers are large, lax, and powdery, the cheeks are extensively naked, and the base of the bill is carunculated. This duck greatly exceeds the ordinary kind in size, and the male is far larger than the female. The general colour is glossy blue black, varied more or less with white, the head is crested, and a scarlet fleshy space surrounds the eye, continued from scarlet caruncles at the base of the beak. Tail destitute of the curled feathers so conspicuous in the tail of the common drake.

The species is well known in a domestic condition, not only in our own island but throughout Europe generally. According to Buffon, these birds were introduced into France in the time of Belon (about 1540). The latter author calls them *canes de Guinée*, a circumstance which proves that their original country was not then correctly ascertained. The species was known to Ray, who terms it *anas sylvestris Braziliensis*, the wood duck of Brazil. Linnæus, who was well acquainted with the original country, and gave it the appellation of *anas moschata*, says in his *Fauna Suecica*, it is reared on the farms of the gentry, but is not indigenous in Sweden—"In prædiis magnatum culta; nullibi Sueciæ spontanea." Marcgrave, who describes the musk duck as black with white shoulders, terms it "anas sylvestris, magnitudine anseris" a woodland duck as large as a goose; he observes that it is

common in Brazil, Guiana, and Paraguay. Latham informs us that this bird is called *patas* in Brazil, where it is sometimes seen in vast flocks; he also adds, that the Guaranis call it *upeguazo* (great duck), and the Spaniards *pato real o'grande* (greater royal duck). In Paraguay it is seen either in pairs, or in flocks of twenty or thirty, which roost together on high trees; the female lays in September from ten to fourteen eggs in the hollow of a tree, on a bed of feathers from the breast of the male. After stating that this bird has multiplied in our menageries, the same ornithologist adds, "said to be in a wild state about the Lake Baikal, in Asia." This we suspect to be a mistake; if not, we may not unreasonably conjecture that these wild musk ducks of Lake Baikal are the descendants of individuals which have emancipated themselves, and have made that noted haunt of wild-fowl their abode. For ourselves, we have never been able to ascertain the fact, nor have we ever observed a single specimen of the musk duck in any collection of birds obtained in Asia; indeed we have never seen the specimen of a true wild musk duck at all. Mr. Eyeton, in his valuable work on the duck tribe, states that these birds "are supposed to be originally natives of South America," an expression which evidently implies that he has not been able to verify the original locality of the species. There can, however, be little doubt on this point. Buffon, who states that it is the ypeca-guaçu of Pison, adds that in Guiana it is said to tenant the flooded savannahs, and to build its nest on the trunks of decayed trees; when the young are hatched, the parent, as is asserted, carries them one after another in her beak to the water. They are there, as it would appear, liable to destruction from alligators, for flocks of young are seldom seen exceeding five or six in number, though the eggs are more numerous. Their food in the savannahs consists of the grain of a sort of grass called wild rice. In the morning they visit the immense inundated prairies, and fly towards the sea as the evening comes on; but the hottest hours of the day are passed on the leafy branches of trees. They are fierce and wild, and will not allow themselves to be approached. (See Buffon.)

We might collect the notices of various authorities as to the general habits and original country of this species, but all accounts are in the main details consonant with each other.

With respect to the domestic bird, it requires the same treatment as the ordinary duck, with which it will interbreed;

but we believe the hybrids to be unfertile. The male greatly exceeds the female in size, and is quarrelsome and irascible; when excited it depresses its head, and utters deep hoarse notes in the lowest tone; the flesh is good, as is also that of the hybrids; the eggs are rounder than those of the common duck, and frequently incline to a greenish tint.

The windpipe of the male is stout, nearly equal in diameter, but somewhat smaller towards the bottom; the bony drum, or labyrinth, as in others, is attached to the lower part of the wind-pipe (*trachea*,) just within the chest. This drum is not smooth on the surface, as in the pintail and widgeon, but universally rough and irregularly furrowed with fine indented lines; the opposite side of a pear shape, and placed obliquely, with the point lowest, but is flattened considerably on the surface; the bony arch is on this side smooth, having no appearance of rings, and is bent at a small angle from the trachea, though it constitutes a continuance of it. In old birds the bony labyrinth is more rounded and larger, but still retains the roughness on the surface; in a very old subject the labyrinth was not only much larger but nearly globular, and the texture more bony; that figured by Dr. Bloch, in the *Berlin Trans.* iv., p. 113, pl. xvi., figs. 5 and 6, appears by much too large; but supposing the musk duck to arrive at twice the size of those in England, and which they are said to do, no doubt the labyrinth and trachea would be in due proportion. (See Latham's *Ornithology*.)

SUBFAMILY ANSERINÆ, GEESE.

CANADA GOOSE, or CRAVAT GOOSE (*Anser Canadensis*), *Neeseash* and *Mistehayneeseah* of the Cree Indian, *Wild Goose* of the Anglo-Americans.—Hearne, Wilson, Audubon, Bonaparte, and others have given us full accounts of the habits and manners of the Canada goose in a state of nature. It is the common wild goose of the United States, and its regular periodical migrations are the sure signals of returning spring, or of approaching winter. The tracts of their vast migratory journeys are not confined to the sea-coast or its vicinity, for, in their aërial voyages to and from the north, these birds pass over the interior on both sides of the mountains, as far west at least as the Osage river. "I have never," says Wilson, "yet visited any quarter of the country where the inhabitants are not familiarly acquainted with the regular passing and repassing of the wild geese." It is an opinion

in the States, that they visit the lakes to breed. Most, however, it would appear, wing their way much farther northward; for from the Canadian lakes they migrate to still higher latitudes on the setting in of spring. Hearne saw them in large flocks within the arctic circle, pushing their way still northward. Captain Phipps observed them on the coast of Spitzbergen in lat 80° 27′ N. Audubon found them breeding on the coast of Labrador, and states that the eggs, six or seven in number, of a greenish white, are deposited in a roughly made nest. Bonaparte states that it breeds everywhere throughout the Hudson's Bay territory, and has been observed in the middle of July on the Copper-mine river, not far from its debouchure, accompanied by its newly-hatched young. The cry of the species is imitated by a nasal repetition of the syllable *wook*, or, as Wilson writes it, *honk*.

The destruction of the Canada geese during their migrations is enormous; the autumnal flight lasts from the middle of August to the middle of October; those which are taken in this season, when the frosts begin, are preserved in their feathers, and left to be frozen for the fresh provisions of the winter stock. The feathers constitute an article of commerce, and are sent to England. The vernal flight of these geese lasts from the middle of April until the middle of May. Their arrival in the fur countries from the south is impatiently expected; it is the harbinger of spring, and the month is named by the Indians the goose-moon. Dr. Richardson, in his *Fauna Boreali-Americana*, describes, as follows, the interest caused by the appearance of the flocks in the far countries:—"The arrival of this well-known bird in the far countries is anxiously looked for and hailed with great joy by the natives of the woody and swampy districts, who depend principally on it for subsistence during the summer. It makes its first appearance in flocks of twenty or thirty, which are readily decoyed within gunshot by the hunters, who conceal themselves, and imitate its call. Two, three, or more are so frequently killed at a shot, that the usual price of a goose is the single charge of ammunition. One goose, which, when fat, weighs about nine pounds, is the daily ration of one of the Company's servants during the season, and is reckoned equivalent to two snow-geese (*Anas hyperborea*), or three ducks, or eight pounds of buffalo and moose-meat, or two pounds of pemmican, or a pint of maize and four ounces of suet.

"About three weeks after their first appearance the Canada geese disperse in pairs throughout the country, between the 50th and 67th parallels, to breed, retiring at the same time from the shores of Hudson's Bay. They are seldom or never seen on the coasts of the Arctic sea. In July, after the young birds are hatched, the parents moult, and vast numbers are killed in the rivers and lakes, when (from the loss of their quill feathers) they are unable to fly. When chased by a canoe, and obliged to dive frequently, they soon become fatigued, and make for the shore with the intention of hiding themselves; but as they are not fleet, they fall an easy prey to their pursuers. In the autumn they again assemble in flocks on the shores of Hudson's Bay for three weeks or a month previous to their departure southwards."

The Canada goose feeds on aquatic vegetables and their roots, and delicate marine plants of the genus *ulva*. To this diet they add grain and berries in their season.

The flight of this species is laborious and heavy, and generally in single file, or in the form of two sides of a triangle, the leader, some old gander, being the *apical* bird. From time to time this leader utters his deep "*honk*," which is responded to by the rest of the flock, and which may be translated "What cheer, ho!" "All's well!" Very often, however, all is not well, for the line is scattered by the withering fire of the gunner; often, too, they meet with dense fogs, in which they become bewildered, and after wheeling about alight on the ground, where the gunners give them a warm reception. In some districts the sportsmen take with them into the marshes one or two of the domesticated race, which by their call attract the flocks passing over head, and allure them to destruction.

Wilson says, that, except in calm weather, the flocks of Canada geese rarely sleep on the water, generally preferring to roost all night in the marshes. When the shallow bays are frozen, they seek the mouths of inlets near the sea, occasionally visiting the air-holes in the ice; but these bays are seldom so completely frozen as to prevent them feeding on the bars at the entrance.

The Canada goose is a beautiful species, and its flesh is excellent. The head, two-thirds of the neck, the greater quills, the rump and tail, are pitch-black; the back and wings brocoli-brown, edged with wood-brown; the base of the neck anteriorly, and the under plumage, generally brownish grey;

a few white feathers are scattered about the eye, and a white cravat of a kidney shape forms a conspicuous mark on the throat; upper and under tail coverts pure white; bill and feet black. Such is a brief sketch of the Canada goose in a state of nature. Man, however, has appreciated its value, and it is kept domesticated not only in America, but in many parts of Europe, where it breeds freely. In America the ordinary gray goose of Europe is very common; this indeed we need scarcely say, yet this bird does not thrive there so well as in Europe; hence many prefer the Canada goose, which is equally familiar, and in other respects its equal.

CANADA GOOSE.

This species, as we have said, will breed with the common goose, and it is asserted that the hybrid progeny is far superior in the flavour and sapidity of its flesh to the unmixed progeny of the common goose. Buffon, in whose time the Canada goose was kept in a domestic state in France, says, "Within these few years many hundreds have inhabited the great canal at Versailles, where they breed familiarly with the swans." That is, we suppose, interbreed with the swans, an instance of which has not come under our own notice; the intermediate position, however, of this species renders the fact very probable.

Like the duck and the common goose, the Canada goose under domestication ceases to be as strictly monogamous as it is in its wild state; a circumstance which, in our tame *anatidæ*, results from the plan of keeping but few males, and

these in association with a flock of females, so that the ordinary results of pairing—that is, retirement from the rest to a secluded spot, which the mated pair exclusively occupy—are interfered with. Yet, as may be seen in the instance of the common goose, the male generally attaches himself to a particular female, while she is followed by her brood of goslings over the common, and is energetic in their defence. The instinct is not quite obliterated,—there is a reigning sultana.

We could wish to see the Canada goose more extensively kept in our country than it is at present; it is common as an *ornament* to sheets of water in parks, gardens, and pleasure grounds, but is too much neglected as a bird of *utility;* it is alike valuable for flesh and feathers: at the same time it is not so decided a grazer as is the common goose; the precincts of marshes and ponds which abound in aquatic vegetation, for the procuring of which its strong bill and long swan-like neck afford it facility, offer the most advantageous sites for its establishment, and in such localities we strongly recommend its adoption. With regard to its management little is to be said; the sitting females require secluded nests free from intrusion, and the flock, in addition to the vegetables they pick up, require an allowance of grain. Like most birds known both in a wild and domestic state, the latter exceed the former in weight and magnitude.

The Chinese Swan-Goose, or Chinese Goose (*Anser cygnoïdes*, *Anser Guiniensis*, Brisson; *L'oie de Guinée*, Buffon).

This noble species in its wild state appears to be very extensively spread. It is a native of China and other parts of Asia, and also of Africa, as is asserted, although we have never seen specimens in any collection, either from the western or southern portions of the latter quarter of the globe; we suspect the species to be chiefly confined to the central and oriental portions of Asia. Of its habits in a wild state nothing is known; yet that it is domesticated with the utmost facility we have abundant proof, for it has been long reared in ponds, and on the fresh-water sheets of pleasure-grounds, in our island, as an ornament. At one time several living specimens graced the gardens of the Zoological Society, of which some were brought direct from China. In general form, in length of neck, and in the protuberance at the base of the beak, these birds remind us of the swan, but their gait is more goose-like, and they interbreed freely with the ordi-

nary goose, though we believe the offspring are not fertile, at least among themselves. We have not unfrequently seen this species in farm-yards, as well as broods of mixed origin; and it has often forcibly occurred to us, that so fine a bird, intermediate in size between the goose and swan, has not received the attention generally which it merits; we have, as already stated, seen it or a mixed breed in farm-yards, but still it is not common.

The Chinese goose in domestication varies in colour; its description is as follows:—Bill orange, with a blackish or darkish-coloured protuberance surmounting the base of the upper mandible, and a feathered wattle under the throat; a dark brown stripe runs down the hinder part of the neck from the head to the back; the fore-part of the neck and breast are yellowish gray; the back and all the upper parts are grayish brown; abdomen white; legs orange.

Variety A, with the bill and legs black. Variety B, plumage white, with a pale brown mark down the back of the neck, vanishing at the lower part.

We have but few observations to make on this species. Like the Canada goose, it is far less adapted for grazing than the common goose; nevertheless, it may be reared in farm-yards without trouble.

THE CHINESE GOOSE.

From these intermediate forms we next proceed to the *true geese*, of which the ordinary goose, or rather its wild origin, may be taken as a typical example.

Of the true geese, *anser*, as at present restricted, Europe presents us with the following species —

1. The Gray-lag Wild Goose (*Anser palustris*, Fleming; *Anser cinereus*, Meyer).

2. The Bean-Goose (*Anser ferus*, Fleming; *Anser segetum*, Steph.).—This is the ordinary wild goose, so well known as a periodical visitant during winter to our shores and morasses.

3. The White-fronted Goose (*Anser erythropus*, Fleming; *Anser albifrons*. Bechstein).—This species, like the bean-goose, is a regular winter visitant to our island.

4. The Pink-footed Goose (*Anser phœnicopus*, Bartlett, in *Proceeds. Zool. Soc.*, 1839, p. 3).—A winter visitant to our island, but apparently rare.

Of the four geese to which we have alluded, three are not the originals of our domestic stock; but one is, viz., the gray-lag.

The Domestic Goose (*Anser palustris*, Flem.; var. *Domesticus*).—When, or by what people, the goose was reclaimed, it is impossible to say; but that it is a descendant of the gray-lag cannot be doubted. Their essential characters are the same: "no disinclination to breed with each other is evinced between them, and the offspring of wild and domesticated birds are as prolific as their natural parents." The gray-lag is not an Arctic bird. Temminck says that it seldom advances beyond the 53rd degree of north latitude. Consequently its migratory movements are on a limited scale, and irregular. Its geographical range extends over the central and eastern parts of Europe, Central Asia, and some parts of Western Africa. Formerly it was abundant in our island as a permanent resident, breeding in the fenny counties, such as Lincolnshire, Cambridgeshire, &c.; but from these seats it has been long banished, together with the stork, the spoonbill, and the crane, and driven to more congenial abodes. Our great marshes and fens of the olden time, in which alone such birds could have found security, have, by drainage, been gradually circumscribed, and extensive lands, once morasses or under water, are now rich farms devoted to the plough. In feudal England, towns and villages were few, small, and far apart; vast districts were left uncultivated and unpopulated. Intestine and foreign wars thinned the island of its population; frequent famines, with accompanying diseases, contributed to

the same effect; the mass of the people were serfs or bond slaves; their wholesale destruction was scarcely deemed worth notice by the historian; death, or torture, or fines and imprisonment, were the doom of the unfortunate man who killed beast or bird of chase, even by accident. The hunting and the hawking of the prince and noble were paramount in importance to agriculture; nay, as if the country were not sufficiently depopulated for the pleasure of regal and baronial Nimrods, hundreds of acres were cleared of human inhabitants, and given to the deer and the wild boar, and to wild fowl of all kinds, for the gratification of the huntsman and the falconer. But the improvement of agriculture, the advancement of commerce, the increase of human population, all making progress as feudal usages and laws became one after another obsolete, gradually effected changes, not only on society at large, but on the face of the country in general; and although at first this alteration of things was scarcely perceptible, yet, once begun, it proceeded with increasing momentum, until the face of England assumed a new appearance. Our forests are gone, our parks circumscribed, our marshes drained; so that, if the conquering Normans, or, to go back still further, the haughty Cæsar, were (could it be possible) to revisit our island, they would not know the country in which they played their part. That similar changes in the zoology of an island of no great extent should have accordingly taken place, cannot be a matter of surprise; yet, in this point of view (as in others), indications of what was in the by-gone time are not altogether wanting. For example (to confine our observations to the humble subject before us), although the gray-lag goose is no longer indigenous, still a few flocks in winter, wandering perhaps from the lakes and fiords of Norway, occasionally pay us a visit, and sojourn for a time among our marshes, or on the lowlands near the coast. These flocks evince all the vigilance and shyness which the *anseres* display in common. While feeding, sentinels are on the watch, and these raise, on the slightest suspicion, a cry of alarm which rouses the flock to instant activity. The same precaution is observed at night; and it was thus, if records speak true, that by the vigilance of this bird the Roman Capitol was saved from the assault of the Gauls.

Bartlett's description of this species (*Proceeds. Zool. Soc.*) is very accurate:—"Entire length, 35 inches; extent, 64; from the carpal joint to end of wing, 17½ inches. The plumage

more cinereous than in the bean-goose; the shoulders and rump light gray; breast and belly white, sometimes spotted with black; the bill 2¼ inches long, more robust, deeper, broader, and with the laminæ much more developed than in the bean-goose; colour a dull yellow, inclining to a flesh tint towards the nail, which is white; in summer the bill assumes a redder tint; legs and feet pale flesh colour; wings, when closed, even with the end of the tail. The young of this species are darker than the adults, but the gray upon the shoulders and rump, the form of the bill, and the colour of the legs and feet, will always distinguish them from the young of any of the other species." Pennant says that the upper and under tail coverts are pure white; the middle tail feathers dusky, tipped with white, the exterior feathers being almost wholly white. Weight of the heaviest, about ten pounds. The young, when captured, according to the same authority, were often tamed (in his day); they were esteemed most excellent meat, superior to the domestic goose. The old geese which are shot are, he says, plucked and sold in the market as fine tame ones, and readily bought, the purchaser being deceived by the size, but their flesh is coarse. Towards winter, he adds, they collect in great flocks, and live and feed in the fens. Pennant lived from 1726 to 1798. Great are the changes which have occurred since his time! Then the gray-lag resided, as he says, in the fens the whole year, breeding there, and hatching about eight or nine young; but now even winter visitants are not very common, while the truly migratory bean-goose is abundant throughout winter in appropriate situations.

From this cursory, yet not irrelevant, account of the gray-lag goose, let us turn to its domestic relative, which, as is usual, varies much in colour, rather as to the amount of gray on the plumage than as to tint—the white often predominating—some, especially ganders, being wholly of the latter hue.

Extensively spread as the wild goose is, and ever has been, we believe that different nations or tribes, either at or about the same time, or from time to time, rendered the young domestic, and that in distant portions of the earth the goose was reclaimed from the wild breed. The same observation applies to the duck. Unlike the fowl and the turkey, they had not to radiate from a certain centre; the same wants everywhere incite to the same attempts, and, *cæteris paribus*, with equal

success. Cæsar found the fowl and the goose domesticated in Britain. The fowl must have been an importation, and perhaps a then recent one; the goose was most probably domesticated from young birds, or from old ones captured in nets or traps, indigenes of the island. The Britons had no occasion to receive this bird from other countries—yet in other countries, far and wide, was the goose, long before Cæsar's time, a common domestic bird.

THE COMMON GOOSE.

If we traverse a common on which geese are kept, we find the flocks of the respective owners keeping together, and if by chance they mingle on the pond or sheet of water, they separate towards evening, and retire, each flock to its own domicile. On extensive commons, where many thousands of geese are kept, this rule is scarcely ever broken; the flocks of young geese brought up together, as their parents were before them, form a united band, and thus distinct groups herd together, bound by the ties of habit.

Within the last few years, comparatively speaking, our extensive commons have been inclosed, or at least greatly circumscribed, and the number of geese kept by the farmers around, who had right of grazing, has been reduced accordingly. A friend in Wiltshire informs us, that he remembers the time in which certain wide commons were the grazing grounds of thousands of geese belonging to different owners, each of whom had his own mark impressed by a punch on the webs between the toes of the birds—seldom, however, did the

flocks commingle; goose-herds attended them, watching over the interests of their particular charge, and seeing them safely penned up for the night. These flocks were valuable, partly for their feathers, though not altogether so, for great numbers were consigned to fatteners for the London market; and hundreds, put upon their travels, were sold to casual buyers from stage to stage along the road.

Many geese, as we have seen, are reared in Surrey on the heaths or commons; and Lincolnshire still produces thousands. We do not now look to our home-bred geese for feathers, as we did some years since, for the Continent is our chief resource; still the picture given by Pennant is not altogether effaced;—he informs us that geese in his day were kept in multitudes in the fens of Lincolnshire, a single person having frequently a thousand old geese, each of which reared on an average seven young ones; so that, towards the end of the season, the owner became possessed of about eight thousand.

"During the breeding season," says Pennant, "these birds are lodged in the same houses with the inhabitants, and even in their very bed-chambers; in every apartment are three rows of coarse wicker pens, placed one above another; each bird has its separate lodge divided from the other, of which it keeps possession during the time of sitting. A person called a *gozzard*, i.e., a goose-herd, attends the flock, and twice a day drives the whole to water; then brings them back to their habitations, helping those that live in the upper stories to their nests, without ever misplacing a single bird. The geese are plucked *five* times in the year; the first plucking is at Lady-day for feathers and quills, and the same is renewed four times more, between that and Michaelmas for feathers only. The old geese submit quietly to the operation, but the young ones are very noisy and unruly. I once saw this performed, and observed that goslins of six weeks old were not spared, for their tails were plucked, as I was told, to habituate them early to what they are to come to. If the season prove cold, numbers of the geese die by this barbarous custom. When the flocks are numerous, about ten pluckers are employed, each with a coarse apron up to his chin. Vast numbers of geese are driven annually to London to supply the markets, among them all the superannuated geese and ganders (called the *cagmags*), which, by a long course of plucking, prove uncommonly tough and dry."

In Pennant's time the feathers from Somersetshire were esteemed the best; those from Ireland the worst. Mr. M'Culloch, in his *Statistical Account of the British Empire* (1839), says: "The best geese are found on the borders of Suffolk and Norfolk, and in Berks. Somerset furnishes the best goose feathers for beds."

With respect to the treatment of geese little need be said. They require a dormitory apart from other fowls, and a green field or common with a convenient pond of water, such as we see at Barnes. Let not, however, the keeper of geese suppose that their daily grazing is sufficient for their maintenance in proper condition; on the contrary, they require a good supply of grain, oats, or barley, morning and evening, and to deny them this is folly as well as cruelty. Many young geese common-fed only, pine and die for want of sufficient nutriment. Dysentery attacks them, accompanied by spasms of the limbs, or cramp, as it is called; this disease is aggravated by cold and wet, their impoverished system is destitute of stamina, and thus a fair flock, prospering in spring, is more than decimated before autumn.

What is *worth* doing is worth doing *well*. Do not keep stock if you cannot *properly keep* them. "Let the flock's good feed be the master's heed; what at first he may cast will be doubled at last."

Thousands of geese are sent from various parts of the country to persons engaged in the business of preparing them for the market; for example, in the *Lincolnshire Chronicle* for December, 1845, it was stated that Mr. Robert Fuller, a poulterer, of Boston, killed in one week, for the London Christmas market, 2400 geese, 1000 ducks, and 500 turkeys, which altogether weighed upwards of twenty tons.

The management of geese by the great feeders in the vicinity of London is thus detailed in a communication to Mr. Moubray:—"Cleanliness, punctuality, and regularity prevail; the business is conducted, as it were, by machinery, rivalling the vibrations of the pendulum in uniformity of movement. The grand object of preparing, not geese only, but poultry in general, for market, in as short a time as possible, is effected solely by paying unremitting attention to their wants; in keeping them thoroughly clean; in supplying them with proper food (dry, soft, and green), water, exercise-ground, &c. On arriving at the feeder's, they are classed according to condition, &c.: they soon become reconciled to their new

abode, and to each other. They are fed three times a day; and it is truly astonishing how soon they acquire the knowledge of the precise time; marching from the exercise-ground to the pens like soldiers in close column. Goslings, or young geese, come to hand generally about the month of March, after which a regular and constant supply arrives weekly throughout the season. At first they are fed on soft meat, consisting of prime barley or oat-meal, afterwards on dry corn. An idea prevails with many, that any sort of corn will do for poultry; this is a grand mistake. Those who feed largely know better, and invariably make it a rule to buy the best. The Messrs. Boyce of Stratford, whose pens are capable of holding the extraordinary number of 4000 geese, independent of ducks, turkeys, &c., consume twenty combs of oats daily, exclusive of other food."

Green geese are brought very early and in great numbers to the London market, where they sell at high prices. They are usually fattened on oatmeal and peas, mixed with skimmed milk or buttermilk—also upon oats or other grain, and are ready for the table at the age of about four months Green geese are very delicate, but many prefer the Michaelmas goose, after it has fed upon the stubble-fields, and gleaned in the barn-yard.

Persons who breed geese generally assign one gander to four or five females. In mild seasons the goose lays early; she sits with exemplary patience, but ought, during incubation, to be well supplied with food and water placed in a convenient and undisturbed situation, to which she may have free access. The gander is very attentive to his favourite, sits by her, and is vigilant and daring in her defence.

The goslins, or gulls as they are termed in some parts, require the same treatment as ducklings; it is advisable to pen the mother for a few days upon a dry grass plot or green sward, supplying her with water and grain, of which the young will partake; green food, as chopped cabbage, or beet-leaves, oat-cake cut small, and the like, may be given. One thing is imperative: let not the young be starved upon the grass of poor common land—this miserable pasturage occasions disease and mortality; a few handfuls of corn given morning and afternoon, even from selfish motives, would turn to good account in the long run, but humanity commands what selfishness grudgingly allows.

CHAPTER VIII.

DISEASES.

Fowls and poultry in general are subject to various diseases, as *apoplexy*, *diarrhœa*, *rheumatism*, the *pip* or *thrush*, the *croup* (often termed *roup*), the *gapes*, *inflammation of the tail gland* (also called the *roup*, though the term be improperly applied), and other diseases, which are not understood. Now, let us at once confess our ignorance relative to the treatment of fowls under their many maladies. Their ailments have hitherto failed, with perhaps one exception, to attract scientific observation, and no wonder. Who attends to them? what complaint do they make? and when they die, who, acquainted with the symptoms before death, makes a post-mortem examination, and then refers those symptoms to the morbid appearances which his scalpel has revealed? We ourselves have examined after death hundreds of birds of all tribes and species, and have been able only to detect, as the cause of their dissolution, the following *active* disorders:—*Apoplexy*, evidenced by inflammation of the membranes of the brain, or by effusion of blood within or upon it; *peritoneal inflammation*, rapidly fatal; *inflammation of the lungs*, including the bronchial tubes; *tracheal inflammation* (or gapes), with parasitic worms in the windpipe; *inflammation of the mucous membrane of the intestines*, evidenced by previous dysentery; and *inflammation or intumescence of the rump gland*, symptomatic of a *febrile condition*. These are the post-mortem data which, in most cases, have been presented to us. But what shall we say as to the treatment of poultry under disease? Very little. To speak the truth, neither are their diseases well understood, nor is the treatment of them anything but empirical. Yet a few observations seem to be required. As to

APOPLEXY,

we can only say that it makes its attack in most instances without the slightest previous warning. Could it be known

that a bird was in danger of this exigency, means might, perhaps, be taken to insure safety. We have known hundreds of aviary birds, in the finest health apparently, drop dead from their perch, and, as our dissections have assured us, from this cause. They were overfed; they had not to exercise themselves in the task of seeking for food; they had an allowance in unlimited measure, but had no according measure of muscular exertion; they "did not earn their bread before they ate it," as wild birds do. "*Experientia docet.*" We have no other advice to give as to the means of *prevention.*

With respect to the

PIP, OR THRUSH,

we regard it as a token of derangement of the mucous membrane of the alimentary canal generally, and not as a local disease; it is *symptomatic.* Its cure will be effected by low diet, that is (in the case of fowls), by an allowance of fresh vegetable food, mixed with potatoes and a little oatmeal, granting at the same time a plentiful supply of pure water. Give of castor-oil a teaspoonful, or thereabouts, according to age and strength. Do not scrape the tongue, nor use rough modes of cleaning it, but apply a little *borax*, dissolved in tincture of myrrh and water, by means of a camel-hair pencil, two or three times a day. We should here observe, that the symptoms of *pip* consist in a thickening of the membrane lining the tongue and palate, which causes an obstruction to free inspiration, and makes the poor sufferer gasp for breath; the plumage becomes ruffled, the bird mopes and pines, the appetite fails, and is at last utterly extinguished, the bird at length dying, worn out by fever and starvation.

There is a very fatal disease, called

GAPES (INFLAMMATION OF THE TRACHEA),

to which all our domestic gallinaceous birds, as well as pheasants and partridges, are subject, and which often occasions great mortality. In the first instance it appears to arise from a croupy or catarrhal affection, which is indicated by running at the nostrils, watery eyes, alteration of voice, and loss of appetite and spirits. The bird dies. If the trachea be examined, it will be found replete with narrow worms, about half an inch in length, imbedded in slimy mucus. This singular worm is the *syngamus trachealis*, or *distoma lineare.* It consists of a long and short body, united together; the

long body is the female, the short body the male—each, were it not that they are permanently united together, being an animal distinct and perfect in itself. Whether these parasitic worms are the cause or consequence of the disease, we pretend not to say, nor can we tell how they become introduced into the trachea; this, however, seems certain, that their removal is requisite to give the feathered patient a chance of recovery. This can be done by means of a feather, neatly trimmed, which is to be introduced into the windpipe, and turned round once or twice, and then drawn out. It will dislodge the worms, and bring back many of them adhering with slime unto it. This plan requires great dexterity, and some knowledge of the anatomy of the parts. A slow, unskilful operator may kill the already half-suffocated bird, instead of curing it. Another mode of destroying these worms is by putting the birds in a box, and making them inhale the fumes of tobacco, thrown into it through the stalk of a tobacco-pipe. Some recommend the forcing of tobacco-smoke down the bird's throat, and others that the mouth be crammed with snuff; while many place faith in the efficacy of a pinch of salt, introduced into the back part of the mouth. Let us suggest something like a scientific mode of treatment. Give a grain of *calomel*, made up with bread into a pill, or two or three grains of Plummer's pill (*pil. hydr. submur. co.*, London Pharmacopœia); after which, let flowers of sulphur be administered, with a little ginger, in pultaceous food composed of barley-meal. In the meantime, let the bird be kept in a dry, warm shed or room, apart from the rest of the fowls, as we suspect the disease to be infectious. Let the mouth and beak be washed with a weak solution of chloride of lime. A correspondent, who dates his letter from Wootton, Christ Church, assures us that turpentine is the *only* remedy on which to depend. His words are, "Half a teaspoonful of spirits of turpentine, mixed with a handful of grain, is a certain cure in a few days, giving a handful of such grain to a couple of dozen young chicks each day. It is the most perfect and unfailing remedy. I communicated this receipt to the *Gardeners' Chronicle* (No. xxix., July 17, 1847, p. 476), and I understand it has been found, by other persons besides myself, to be successful—perfectly so. In this part of England, it is the only disease of chickens; and for two seasons the number that died of it was very great." The *rationale* of this mode of treatment is as follows:—The turpentine is absorbed into the system, and

so brought into contact with the parasitic worms in the wind-pipe, to which it is speedily fatal; they are then ejected with the mucus; and the cause of irritation being thus removed, the bird speedily recovers. In what *roup* (not the inflammation of the tail gland, often so called) differs from this laryngeal disease, we do not know. We suspect the word to be a corruption of *croup*, and this latter term is truly applicable to the malady in question. Wet, ill-feeding, an ill-ventilated fowl-house, confinement on a spot or plot of ground tenanted year after year by fowls without attention to cleanliness, to renovation of the soil, and a proper allowance of gravel, ashes, fresh vegetables, &c., these are the causes which produce this and many other diseases. At the same time, be it observed, the gapes is an epidemic disease, and often thins the preserves of pheasants and the coveys of partridges.

INFLAMMATION OF THE LUNGS,

including the bronchial tubes, is not uncommon. Its symptoms are quick breathing, often with a rattle or râle, very audible, dulness, disorder of plumage, vacancy in the eye, and indisposition to stir. Death is not to be prevented by any remedy we can point out. Why, then, should we pretend to enlarge in a series of directions? Human patients can explain their feelings—cattle, to a certain degree, indicate them, and speak in dumb eloquence; but birds give little indications, by voice or manner, leading to what the medical man calls a *diagnosis*. Besides, how are we to bleed a bird? Few, perhaps, have had more experience with respect to birds, or dissected more, than the writer, and yet we cannot lay down any directions on the point. In fact, the skin of most birds is very thin—it is unsupported by a thick mass of cellular tissue, and the vessels which ramify upon it are minute, none presenting a fair chance for successful venesection. To cut and wound a bird at random, for the purpose of obtaining a flow of blood, is barbarous.

PERITONEAL INFLAMMATION, OR PERITONITIS.

This disease runs so rapid a course, that death not unfrequently occurs before any marked symptoms have appeared indicative of active disease. The bird, perhaps, appears a little drooping, it refuses to eat, but as it is highly fed, this circumstance occasions no surprise; it retires to its roost, and is found dead in the morning. Examination at once

reveals the cause of death—the peritoneal membrane exhibits all the indications of active inflammation. We have noticed the occurrence of the same disease among carnivorous mammalia. An animal appears to be as well as usual—at least it attracts no observation—but it dies suddenly. On opening the body, the cause is manifest—*Peritonitis* has done its work.

INFLAMMATION OF THE MUCOUS MEMBRANE OF THE INTESTINAL CANAL

is usually evinced by *Dysentery*. The bird pines; it is purged; in a little time the evacuations become more or less tinged with blood, and death ensues. Damp and improper food are the causes of this affection. It can be treated with success only in the early stage. First give a small quantity of castor-oil. This will clear the bowels of irritating secretions. Afterwards, let the bird have doses of the *Hydrargyrum cum cretâ* (of the London Pharmacopœia), rhubarb, and laudanum—

Of the hydr. cum cretâ, 3 grains.
„ rhubarb 2 or 3 grains.
„ laudanum 2, 3, or 4 drops.

Mix in a teaspoonful of gruel, or gum-water. To be given once or twice a day.

SIMPLE DIARRHŒA

may be generally cured by a change of diet, and a little chalk given in gruel.

CONSTIPATION OF THE BOWELS

will yield to castor-oil, and a diet upon oatmeal porridge and green vegetables.

We have seen both fowls and pigeons affected with a sort of

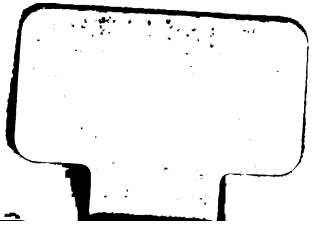
ASTHMA,

evidenced by difficulty of breathing and a wheezing, rattling noise on inspiration. It is the result of a thickening of the bronchial tubes from previous inflammation, often accompanied by an alteration in the structure of the cellular tissue of a portion of the lungs. We can lay down no rational plan of treatment likely to effect a cure.

INFLAMMATION AND INTUMESCENCE OF THE RUMP GLAND

is generally symptomatic of a febrile condition of the system. To this affection the term *roup* (an indefinite term for all the diseases of poultry) is often applied. The treatment is simple. Let the swelling be opened by a lancet, and the matter gently squeezed out; afterwards foment well with warm water, put the bird upon a diet of oatmeal and green vegetables, and, if necessary, give a teaspoonful of castor-oil. Be sure that the roosting-place is clean and well ventilated.

MOULTING.

This process is natural, and consists in the gradual exchange of old feathers for new ones. Nevertheless, it often happens that birds in a state of domestication, especially while young, have not sufficient vital energy for the accomplishment of the change. They require improved diet, warmth, and good water. Of course we suppose that their roosting-place is properly sheltered and ventilated. A grain or two of cayenne pepper, made into a pill with bread, may be given daily with advantage. Saffron is useless; but a nail, or any bit of iron, may be put into the drinking-trough, in order to render the water chalybeate.

Fowls are subject to a *loss of feathers*, which must not be confounded with moulting. At first the plumage appears ruffled and disarranged; then the feathers begin to drop out, and continue to fall till the bird is greatly denuded. In the meantime it is dull and destitute of appetite, and becomes thin and feeble. We have generally observed this disease among poultry kept in a limited space, debarred from exercise and good air, with a wet soil beneath them, having little or no gravel, nor any dusting-place in which to clean their plumage. This disease is analogous to the mange in cattle, and is not easily cured. A change of diet, good air, cleanliness, and a dusting-place (or, as some call it, a *dust-bath*), are essential. Some recommend small quantities of sulphur and nitre, mixed with butter, to be daily given.